DOCUMENT RESUME

ED 276 328 HE 019 501

TITLE	Teaching to Potential. Proceedings of the Regional Conference on University Teaching (2nd, Las Cruces, New Mexico, January 9-10, 1986).
INSTITUTION	New Mexico State Univ., Las Cruces.
PUB DATE	86
NOTE	586p.
PUB TYPE	Collected Works - Conference Proceedings (021) -- Viewpoints (120) -- Reports - Research/Technical (143)
EDRS PRICE	MF03/PC24 Plus Postage.
DESCRIPTORS	College Curriculum; *College Instruction; College Role; *Cultural Differences; *Educational Objectives; Graduate Study; Higher Education; *Minority Groups; *Research; Teacher Education; Teaching Assistants; Technology Transfer; *Theory Practice Relationship; Undergraduate Students

ABSTRACT

Proceedings of a regional conference on teaching to potential are presented. The 48 papers address three areas of concern: training or educating--future requirements, cultural diversity in higher education, and relating disciplinary research to university teaching. Papers and authors include: "Training or Education: Future Requirements for the Profession of University Teaching" (Mark H. Curtis); "Technology Transfer through Training: Emerging Roles for the University" (Harold M. Bergsma); "Curricula for the Twenty-First Century" (W. Brock Brentlinger); "An Analysis of Student Expectations regarding Concepts of Teaching Format" (Edsel Buchanan); "Training Knowledge Workers: A New Perspective on Graduate Education" (Paulette Chaffin, William Ammentorp); "Future Requirements in Management Training--Teaching at the University Level" (Barbara G. Connellee); "Reaching for the Potential, II: Identifying and Reaching Teacher Goals" (Paul R. Dingman); "The Necessity of Training before Education: The Fingertip Effect and Learning as Related to Teaching Computer Skills to Faculty" (Carlton W. Dukes); "Cultural Diversity in Higher Education: A Critical Continuing Issue" (Tomas A. Arciniega); "Mexican American Faculty in the Southwest: Some Survey Results" (Adalberto Aguirre); "The College Classroom: Changing Climates and Cultures" (Len Ainsworth); "Cultural Diversity: An Expectation for Teaching" (Narviar Cathcart Barker); "Graduate Training for Administrative Positions: A Conceptual Model" (Janet Burke); "Messages in the Classroom: Culture Is Communication" (Jean M. Civikly); "Teaching and Research: The Necessary Balance" (Glenn A. Crosby); "The Electoral College in 1988: A Model for Nationwide Campus Simulations" (Charles T. Barber); "The Value of Analysis of Standardized Placement Exams: A Case Study of Cell Structure" (Robert V. Blystone); "Writing in the Disciplines: Research and Implications" (Christopher C. Burnham); "Test Anxiety and Academic Achievement" (Moon K. Chang); and "A Model for Bridging Theories and Applications" (Lily Chu). (SW)

RECEIVED
ERIC/CHESS

ED276328

SECOND REGIONAL CONFERENCE ON UNIVERSITY TEACHING

Teaching to Potential

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
New Mexico
State Univ.
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

NEW MEXICO STATE UNIVERSITY
LAS CRUCES, NEW MEXICO

HE 019 501

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

- Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

PROCEEDINGS
1986

BEST COPY AVAILABLE

TABLE OF CONTENTS

PAGE

PURPOSE: James E. Halligan, President
New Mexico State University v

PROGRAM vi

THEME: TRAINING OR EDUCATING: FUTURE REQUIREMENTS

Mark H. Curtis - Theme Speaker - TRAINING OR EDUCATION: FUTURE REQUIREMENTS FOR THE PROFESSION OF UNIVERSITY TEACHING 1

Harold M. Bergsma - TECHNOLOGY TRANSFER THROUGH TRAINING: EMERGING ROLES FOR THE UNIVERSITY 19

W. Brock Brentlinger - CURRICULA FOR THE TWENTY-FIRST CENTURY 29

Edsel Buchanan - AN ANALYSIS OF STUDENT EXPECTATIONS REGARDING CONCEPTS OF TEACHING FORMAT 41

Paulette Chaffin, William Ammentorp - TRAINING KNOWLEDGE WORKERS: A NEW PERSPECTIVE ON GRADUATE EDUCATION 51

Barbara G. Connellee - FUTURE REQUIREMENTS IN MANAGEMENT TRAINING--TEACHING AT THE UNIVERSITY LEVEL 67

Paul R. Dingman - REACHING FOR THE POTENTIAL, II: IDENTIFYING AND REACHING TEACHER GOALS 77

Carlton W. Dukes - THE NECESSITY OF TRAINING BEFORE EDUCATION: THE FINGERTIP EFFECT AND LEARNING AS RELATED TO TEACHING COMPUTER SKILLS TO FACULTY 89

Michael J. Ellerbrock - THE TEACHER/SCIENTIST: FROM TRAINER TO EDUCATOR 101

Celestino Fernandez - TRAINING OF GRADUATE TEACHING ASSISTANTS: A CASE STUDY 111

Charles H. Frost - THE VALUE OF A LIBERAL ARTS EDUCATION TO THE PROFESSIONALLY TRAINED 125

Terry L. Loveland, C. Lyn Abercrombie - INTERNATIONAL BUSINESS COURSES--DEVELOPING A HANDS-ON EXPERIENCE 137

Thomas L. Millard - ACTIVE LEARNING: THE EQUILIBRIUM BETWEEN STUDENT WRITING AND CRITICAL THINKING 149

PAGE

Wayne Moellenberg - PROFESSIONALIZATION OF TEACHER PREPARATION 161

Thomas A. Musiak - COLLABORATION INSTRUCTION IN MULTIDISCIPLINARY SETTING 173

Eugenie Potter - KNOWLEDGE FOR THE FUTURE: A PRIMER ON ARTIFICIAL INTELLIGENCE FOR EDUCATORS 193

Jacqueline Sheehan, Barbara Lindsay, William H. Matchett - IMPROVING SKILLS OF TEACHING ASSISTANTS 205

Norma Neahr Wilkerson - RELATIONSHIPS BETWEEN PREFERRED LEARNING AND CLINICAL ACHIEVEMENT OF BACCALAUREATE NURSING STUDENTS 217

THEME: CULTURAL DIVERSITY IN HIGHER EDUCATION

Tomas A. Arciniega - Theme Speaker - CULTURAL DIVERSITY IN HIGHER EDUCATION: A CRITICAL CONTINUING ISSUE 229

Adalberto Aguirre - MEXICAN AMERICAN FACULTY IN THE SOUTHWEST: SOME SURVEY RESULTS 249

Len Ainsworth - THE COLLEGE CLASSROOM: CHANGING CLIMATES AND CULTURES 257

Narviar Cathcart Barker - CULTURAL DIVERSITY: AN EXPECTATION FOR TEACHING 265

Janet Burke - GRADUATE TRAINING FOR ADMINISTRATIVE POSITIONS: A CONCEPTUAL MODEL 277

Jean M. Civikly - MESSAGES IN THE CLASSROOM: CULTURE IS COMMUNICATION 287

Michael Fitzgerald - THE FATE OF A CULTURALLY DIVERSE LIBERAL ARTS PROGRAM: THE MEDGAR EVERS COLLEGE EXPERIMENT, 1977-85 299

George K. Green - THE LATIN LINK BETWEEN ENGLISH AND SPANISH: METHODOLOGICAL IMPLICATIONS FOR LANGUAGE INSTRUCTION, MOST ESPECIALLY IN THE SOUTHWEST 311

Herbert K. Heger, Terry Salinger - PREPARING MINORITY STUDENTS FOR COLLEGIATE STUDY: A SUGGESTED HIGH SCHOOL-COLLEGE TRANSITION PROGRAM 323

Norma G. Hernandez, Jorge Descamps - INVOLVING MEXICAN AMERICANS IN HIGHER EDUCATION: AN UNTAPPED POTENTIAL 337

John H. Hummel, J. David Fairbanks - MORAL EDUCATION IN A MULTICULTURAL SETTING 347

TABLE OF CONTENTS

PAGE

PURPOSE: James E. Halligan, President
New Mexico State University v

PROGRAM vi

THEME: TRAINING OR EDUCATING: FUTURE REQUIREMENTS

Mark H. Curtis - Theme Speaker - TRAINING OR EDUCATION: FUTURE REQUIREMENTS FOR THE PROFESSION OF UNIVERSITY TEACHING . 1

Harold M. Bergsma - TECHNOLOGY TRANSFER THROUGH TRAINING: EMERGING ROLES FOR THE UNIVERSITY 19

W. Brock Brentlinger - CURRICULA FOR THE TWENTY-FIRST CENTURY 29

Edsel Buchanan - AN ANALYSIS OF STUDENT EXPECTATIONS REGARDING CONCEPTS OF TEACHING FORMAT 41

Paulette Chaffin, William Ammentorp - TRAINING KNOWLEDGE WORKERS: A NEW PERSPECTIVE ON GRADUATE EDUCATION 51

Barbara G. Connellee - FUTURE REQUIREMENTS IN MANAGEMENT TRAINING--TEACHING AT THE UNIVERSITY LEVEL 67

Paul R. Dingman - REACHING FOR THE POTENTIAL, II: IDENTIFYING AND REACHING TEACHER GOALS 77

Carlton W. Dukes - THE NECESSITY OF TRAINING BEFORE EDUCATION: THE FINGERTIP EFFECT AND LEARNING AS RELATED TO TEACHING COMPUTER SKILLS TO FACULTY 89

Michael J. Ellerbrock - THE TEACHER/SCIENTIST: FROM TRAINER TO EDUCATOR 101

Celestino Fernandez - TRAINING OF GRADUATE TEACHING ASSISTANTS: A CASE STUDY 111

Charles H. Frost - THE VALUE OF A LIBERAL ARTS EDUCATION TO THE PROFESSIONALLY TRAINED 125

Terry L. Loveland, C. Lyn Abercrombie - INTERNATIONAL BUSINESS COURSES--DEVELOPING A HANDS-ON EXPERIENCE 137

Thomas L. Millard - ACTIVE LEARNING: THE EQUILIBRIUM BETWEEN STUDENT WRITING AND CRITICAL THINKING 149

PAGE

Wayne Moellenberg - PROFESSIONALIZATION OF TEACHER PREPARATION 161

Thomas A. Musiak - COLLABORATION INSTRUCTION IN MULTI-DISCIPLINARY SETTING 173

Eugenie Potter - KNOWLEDGE FOR THE FUTURE: A PRIMER ON ARTIFICIAL INTELLIGENCE FOR EDUCATORS 193

Jacqueline Sheehan, Barbara Lindsay, William H. Matchett - IMPROVING SKILLS OF TEACHING ASSISTANTS 205

Norma Neahr Wilkerson - RELATIONSHIPS BETWEEN PREFERRED LEARNING AND CLINICAL ACHIEVEMENT OF BACCALAUREATE NURSING STUDENTS 217

THEME: CULTURAL DIVERSITY IN HIGHER EDUCATION

Tomas A. Arciniega - Theme Speaker - CULTURAL DIVERSITY IN HIGHER EDUCATION: A CRITICAL CONTINUING ISSUE 229

Adalberto Aguirre - MEXICAN AMERICAN FACULTY IN THE SOUTHWEST: SOME SURVEY RESULTS 249

Len Ainsworth - THE COLLEGE CLASSROOM: CHANGING CLIMATES AND CULTURES 257

Narviar Cathcart Barker - CULTURAL DIVERSITY: AN EXPECTATION FOR TEACHING 265

Janet Burke - GRADUATE TRAINING FOR ADMINISTRATIVE POSITIONS: A CONCEPTUAL MODEL 277

Jean M. Civikly - MESSAGES IN THE CLASSROOM: CULTURE IS COMMUNICATION 287

Michael Fitzgerald - THE FATE OF A CULTURALLY DIVERSE LIBERAL ARTS PROGRAM: THE MEDGAR EVERS COLLEGE EXPERIMENT, 1977-85 299

George K. Green - THE LATIN LINK BETWEEN ENGLISH AND SPANISH: METHODOLOGICAL IMPLICATIONS FOR LANGUAGE INSTRUCTION, MOST ESPECIALLY IN THE SOUTHWEST 311

Herbert K. Heger, Terry Salinger - PREPARING MINORITY STUDENTS FOR COLLEGIATE STUDY: A SUGGESTED HIGH SCHOOL-COLLEGE TRANSITION PROGRAM 323

Norma G. Hernandez, Jorge Descamps - INVOLVING MEXICAN AMERICANS IN HIGHER EDUCATION: AN UNTAPPED POTENTIAL 337

John H. Hummel, J. David Fairbanks - MORAL EDUCATION IN A MULTI-CULTURAL SETTING 347

PAGE

Robin T. Peterson - HIGHER EDUCATION GOVERNANCE IN YUGOSLAVIA: A CROSS-CULTURAL PERSPECTIVE 359

Ronald Shook - THE ODD COUPLE: HOW WE TEACH AND HOW THEY LEARN 369

THEME: RELATING DISCIPLINARY RESEARCH TO UNIVERSITY TEACHING

Glenn A. Crosby - Theme Speaker - TEACHING AND RESEARCH: THE NECESSARY BALANCE 381

Charles T. Barber - THE ELECTORAL COLLEGE IN 1988: A MODEL FOR NATIONWIDE CAMPUS SIMULATIONS 395

Robert V. Blystone - THE VALUE OF ANALYSIS OF STANDARDIZED PLACEMENT EXAMS: A CASE STUDY OF CELL STRUCTURE 405

Christopher C. Burnham - WRITING IN THE DISCIPLINES: RESEARCH AND IMPLICATIONS 415

Moon K. Chang - TEST ANXIETY AND ACADEMIC ACHIEVEMENT 427

Lily Chu - A MODEL FOR BRIDGING THEORIES AND APPLICATIONS 437

Jim W. Corder - LEARNING FROM LEARNING: NOTES ON WHAT RESEARCH IN RHETORIC TEACHES ABOUT TEACHING 447

Linda Scott DeRosier - HOW ONE THINKS: EXPLICATION OF A LEARNING MODEL 461

Manson P. Dillaway - TEACHING FOR THE FUTURE WITH ALGORITHMS, LEARNING MODULES, AND MICRO-COMPUTERS--AN ACCOUNTING EXAMPLE 473

Gordon J. Ewing - PREDICTING GRADES IN CHEMISTRY 101 485

Daniel G. Ford - TEACHING A FAULKNER NOVEL USING RESEARCH FROM THE DISCIPLINE OF ENGLISH 495

Edwin R. Hoag - VISUALLY AND VERBALLY INITIATED MENTAL IMAGERY AND SUCCESS IN LANDSCAPE ARCHITECTURAL EDUCATION 507

Charles E. Lamb - USING RESEARCH RESULTS IN THE UNIVERSITY CLASSROOM 519

Cherie Lohr, Elene Demos - AN ANALYSIS OF COGNITIVE SKILLS ADDRESSED IN A UNIVERSITY TEACHER EDUCATION PROGRAM 525

Richard L. Long, Jr. - THE DEVELOPMENT OF COURSE ASSIGNMENTS IN CHEMICAL ENGINEERING FOR FRESHMEN AND FIRST YEAR GRADUATE STUDENTS FROM CHEMICAL ENGINEERING RESEARCH 536

PAGE

Randy B. Machemehl - AN EVALUATION OF A SIMPLE COMPUTER-AIDED INSTRUCTION SYSTEM FOR UNDERGRADUATE CIVIL ENGINEERING 545

Jerome A. Schaffran - APPLYING STUDENT DEVELOPMENT THEORIES TO ACADEMIC AND NON-ACADEMIC QUANDRIES 553

Steadman Upham - RESEARCH AND RELEVANCE IN THE UNIVERSITY: THE CASE FOR ANTHROPOLOGY 561

Ruth B. Welborn - INFLUENCERS OF ACHIEVEMENT AMONG NONTRADITIONAL ADULT HEALTH PROFESSIONAL STUDENTS 573

Helena Whyte - WHOLE BRAIN RESEARCH AND IMPLICATIONS FOR SCIENCE TEACHING 581

APPENDIX 593

Donald C. Roush Teaching Award Recipients 595

Commercial Vendors 596

Committee on College Teaching 597

Alphabetic Listing of Authors 598

This year, New Mexico State University sponsored the Second Regional Conference on University Teaching. The purpose of this conference was to share, in a multi-disciplinary manner, research findings on teaching in higher education. The overall conference theme was "Teaching to Potential" with three areas of presentation:

1. Training or Educating: Future Requirements.
2. Cultural Diversity in Higher Education.
3. Relating Disciplinary Research to University Teaching.

I believe the Proceedings will be a helpful and stimulating source of information to those who are motivated to improve their teaching and to conduct further research in this area.

James E. Halligan
President
New Mexico State University

PROGRAM

Second Regional Conference on University Teaching
New Mexico State University
Las Cruces, New Mexico

Thursday/Friday January 9 - 10, 1986
Corbett Center Ballrooms

Conference Theme: "Teaching to Potential"

Thursday, January 9, 1986

8:00 a.m. Coffee and doughnuts
Corbett Center

8:30 a.m. First Plenary Session - West Ballroom
Welcome: Dr. James Halligan, President
New Mexico State University

8:45 a.m. Thematic Address: "Training or Educating: Future Requirements"
Presented by: Dr. Mark Curtis, President Emeritus,
Association of American Colleges

9:30 a.m. General discussion & questions

9:45 a.m.- 1:30 p.m. Commercial Vendor Track

10:00 a.m. Invited Papers and Discussion

1:30 p.m. Second Plenary Session - West Ballroom
Thematic Address: "Cultural Diversity In Higher Education"
Presented by: Dr. Tomas Arciniega, President,
California State College-Bakersfield

2:15 p.m. General discussion & questions

2:30 p.m.- 4:45 p.m. Commercial Vendor Track

2:45 p.m. Invited Papers and Discussion

4:45 p.m. End of First Day

Friday, January 10, 1986

8:00 a.m.	Coffee and doughnuts Corbett Center Ballrooms
8:45 a.m.	Third Plenary Session - West Ballroom: Thematic Address: "Relating Disciplinary Research To University Teaching" Presented by: Dr. Glenn Crosby, Professor of Chemistry Washington State University
9:30 a.m.	General discussion & questions
9:45 a.m.- 1:30 p.m.	Commercial Vendor Track
10:00 a.m.	Invited papers and discussion
1:30 p.m.	"Reflections on University Teaching" Dr. William Conroy Executive Vice President New Mexico State University
1:45 p.m.	Donald C. Roush Awards for Teaching Excellence West Ballroom - Corbett Center Introduction: Dr. Lowery Davis, Deans' Council Representative Presentation: Dr. James Halligan, President New Mexico State University
2:30 p.m.	Reception for Recipients of Donald C. Roush Awards for Teaching Excellence Centennial Room - Corbett Center
3:00 p.m.	End of Conference

TRAINING OR EDUCATION: FUTURE REQUIREMENTS FOR THE PROFESSION OF UNIVERSITY TEACHING

by

Mark H. Curtis

Association of American Colleges

BIOGRAPHY - Mark H. Curtis

Mark H. Curtis recently retired from the position he has held since 1978 as President of the Association of American Colleges, the national association for liberal learning in Washington, D.C. Dr. Curtis is President Emeritus of Scripps college in Claremont, California where he initiated an $8 million capital funds campaign to mark the college's 50th anniversary.

Dr. Curtis was an educational consultant in financial and management affairs for the New York Public Library. He was also the director of Project Athena, an activity of the Claremont University Center, to evaluate the impact of development, pilot, and consultant grants made by the National Endowment for the Humanities.

A former Guggenheim Fellow, Dr. Curtis holds the B.A., M.A., and Ph.D. degrees from Yale University. He is the author of several scholarly publications, including the book, Oxford and Cambridge in Transition, 1558-1642, which was awarded the Robert Livingston Schuyler Prize of the American Historical Association in 1961.

Dr. Curtis has been a trustee of the Claremont University Center, Hawaii Loa College, Loyola-Marymount University, and the Westridge School. In executive and service capacities, Dr. Curtis has been associated with various educational associations and learned societies.

The thesis which I want to put before you at this conference belongs to a worthy tradition. Listen to these words first voiced more than a half century ago:

> "Although universities are institutions for education and research, the primary reason for their existence is not to be found either in the mere knowledge conveyed to students or the mere opportunities for research afforded to members of the faculty.
>
> Both these functions could be performed at a cheaper rate, apart from these expensive institutions. Books are cheap, and the system of apprenticeship is well understood. So far as the mere imparting of information is concerned, no university has had any justification for existence since the popularization of printing in the fifteenth century.
>
> The justification for a university is that it preserves the connection between knowledge and the zest for life, by uniting the young and the old in the imaginative consideration of learning. . .This atmosphere of excitement. . .transforms knowledge. A fact is no longer a bare fact: it is invested with all its possibilities. It is no longer a burden on the memory: it is energizing as the poet of our dreams, and as the architect of our purpose."

These words are, of course, familiar to all of you, even though you may not have read or heard them recently. Alfred North Whitehead first spoke them fifty-eight years ago at the dedication of the then new campus for the Harvard Business School. It is most fitting that we recall them and imaginatively reflect on what they mean at this conference and in these days when technical and professional education has proliferated. Although Whitehead was speaking to the conditions of his own time, he was in a true sense prophetic. He was saying that in any university -- even in its business school -- not only the primary but the distinctive indispensable function is conscientious teaching -- the dialogue between student and teacher which transforms factual knowledge into understanding and helps students develop a lively evolving comprehension of reality.

With this concept of the university and its mission in mind, what can we make of the dichotomy posed by the title of our session this morning?

In approaching an answer to this question, we should first of all note that a contradistinction between training and educating is not the issue that ought to be concerning us. Indeed, to the extent that training is essential to and is a part of educating, any disjunctive distinction between them is probably false. So long, therefore, as training is not equated with educating and is not taken to be an alternative to it, we can forthrightly address a real and important issue, namely how can educating, which often involves training, become that "imaginative consideration of learning" for which Whitehead spoke so eloquently.

Nothing attests to the urgent need to address this issue more than do findings of the principle reports about undergraduate education which have appeared in the last fifteen months. They all express concern about the state of teaching in most American colleges and universities and call for improvements in teaching as one of the chief means to remedy the deficiencies that have crept into undergraduate programs. For instance, Involvement in Learning, the report of the National Institute of Education's Study Group, noted that students are increasingly majoring in narrow specialities and that liberal education is in such decline that many students acquire only fragmented and limited knowledge. It saw these developments as signs of decline in undergraduate education and recommended measures to remedy the situation by improving teaching and especially for first- and second-year students. Integrity in the College Curriculum, the report of the Association of American College's Select Committee on Baccalaureate Degrees, follows its recommendations about the curriculum with a section devoted to proposals for developing a responsible profession of college teaching.

These reports are not, nor do they pretend to be, original or novel in identifying and exposing issues and problems unperceived by concerned faculty and administrators in American higher education. For a decade or more before these reports were issued, the Carnegie Council on Policy Studies, which had commissioned Frederick Rudolph's book on the curriculum among other studies of the state of undergraduate education, was raising questions about the quality of undergraduate programs and the way they were conducted. Among colleges and universities, many faculty and administrators as early as 1970 began to show conscientious misgivings about undergraduate teaching and learning. In response to the invitation of the National Endowment for the Humanities to submit proposals for curricular reform, faculty at scores of institutions in the 1970's sought to remedy weaknesses and fragmentation in baccalaureate education by developing integrated programs in the humanities to provide undergraduates with at least a modicum of common experiences. Even as the reports were being issued, nearly three-quarters of American colleges and universities were either reviewing or revising their general education programs.

As a culmination of such concerns and developments, what the reports in fact did was to sharpen the focus on the key problems that had been emerging, then to admonish the academic community that traditional formulae for resolving such problems were no longer effective, and finally to demonstrate that responsible opinion within the academic community believed it urgent to find appropriate remedies for the shortcomings that were threatening quality in undergraduate education.

Among the issues highlighted by these reports, educating, or to use their term, teaching is the one that concerns us today. To bring some order into our thinking together about the state of college and university teaching, let me recapitulate what I have distilled from these reports.

First, the professional responsibility for college and university teaching is undervalued. The faculty, whose peer judgment is the basis for appointments, promotions and other academic rewards, even as they pay lip service to teaching, place a higher value on research. Furthermore, despite their platitudes about research being essential to maintain the intellectual vitality and effectiveness of teachers, they measure the scholarly and research accomplishments of their colleagues by their publications and not by the changes such achievements may have produced in their course designs or classroom performance. The issues arising from this state of affairs to which we might give some attention are these:

1. What should be done in graduate education to help faculty to restore balance in their attitudes toward all their professional responsibilities, giving due value to teaching as well as research?
2. What should be done in graduate education to prepare faculty to carry out their professional responsibilities for college teaching more effectively?
3. How can college and university faculties and administrators foster due attention to the profession of teaching on their several campuses? What can be done to assure that effective teaching is appropriately evaluated and duly rewarded? How can a campus develop the intellectual environment and means to encourage

faculty to cultivate their teaching effectiveness as a normal part of their professional career development?

In the second place, the present design of many courses and curricula, developed primarily for majors, are too fragmented and specialized to contribute to the common learning or general education of the student body as a whole. Too often, lower division and elective courses in all divisions and school are introductory courses to the major. College faculties have given too little thought to the question of how learning in their respective fields enable non-majors to be competent human beings. How do studies in their respective fields relate to others and enlarge students' understanding of themselves, their society and the universe around them? A recent president of the American Historical Association declared in an address to his colleagues that overspecialization in the undergraduate study of history has seriously impaired its usefulness for students in general because it no longer prepares them to understand how historical consciousness can enable them to meet their civic responsibilities in a democratic society and assist them in making "political decisions that are crucial to all of us." With respect to science, the effects of such practices in course design have led to the state of affairs described in these words by Dr. David Saxon, distinguished physicist and chairman of the board of the Massachusetts Institute of Technology:

> "We are quite unable, as a society, to distinguish between sense and nonsense when it comes to science. . .Educated, intelligent, inquisitive people are unable to bring informed judgement to bear on questions connected in almost any way to science and technology, questions often vital to the welfare of each of us and indeed to the future of the world."

A crucial consideration bearing on this second point is that the mere resurrection of distribution requirements will not resolve the problem. For instance, satisfactory completion of an introductory science course, even if it is a "lab course", will not guarantee that the deficiency lamented by Dr. Saxon will be overcome. Laboratory courses can be -- and too often are -- taught like cooking classes, where students who follow the recipe book faithfully will produce the classical experimental results without learning what has happened, why it has happened, and what it contributes to our understanding of a specific science or the universe.

Hence these issues need to be addressed if we are to take college teaching seriously.

1. How can the motivation of the faculty be enlarged so that teaching for the benefit of the general student is understood and accepted as a genuine challenge to their understanding the mastery of their respective fields and not merely a burdensome chore?
2. What changes in professional activity will enable faculty to design courses and teach in such a fashion that college education will serve the needs of the general student (non-major) as well as the major?
3. What kind of teaching needs to be considered in order to improve specialized education for the majors, even in technical, vocational, or professional fields, by helping them understand how their fields of study and practice are related to others that also provide insight into the society and the world around them?

Let's return to the first of the two major concerns whose attendant issues I have just discussed. In highlighting the neglect of college and university teaching as a matter requiring urgent attention, AAC's Select Committee did not, as some people have hastily and mistakenly concluded, engage in its own version of the sterile and shop-worn argument about research versus teaching. Listen to what they said:

> "The enemy of good teaching is not research, but rather the spirit that says that this is the only worthy or legitimate task for faculty members. An emphasis on teaching, moreover, does not require the denigration of research. . .But teaching comes first. This message must be forcefully delivered by academic leaders responsible for undergraduate education to the research universities that have awarded the Ph.D. degree to generation after generation of potential professors professionally unprepared to teach."

From another perspective, the physicist, Ernest Lynton, in an address given for the George A. Miller Distinguished Lecture Series at the University of Illinois, has said much the same thing. He also severely criticized the attitude engendered by graduate education in America. He noted that throughout the university world today a narrow definition of scholarly activity prevails. "There is," he said, "but one accepted, valued and rewarded scholarly goal: To conduct original research and to publish it in scholarly refereed journals." In the interests of both the universities and the society they serve, he pleaded "for a broader definition of scholarly activity which is more responsive to societal needs and at the same time more consonant with the. . .interests of our faculties." What he called for was the application of trained scholarly talents to the interpretation and dissemination of new ideas and new knowledge -- to teaching in its best and most productive sense. To quote him: "The traditional notion of the scholar focusing solely on the discovery of new knowledge and letting its application and dissemination gradually trickle down to the user is simply no longer appropriate. For every scholar engaged in original work, many more are needed to digest, analyze and interpret the new ideas to make the broadly usable." Since such activity is much more worthwhile than publishing what too often are second-rate and trivial articles, he concluded this point by urging that we "direct the energy of many of our faculty into this direction rather than to confine them to original research and scholarly publications of questionable merit."

The unfilled social and intellectual need which provoked Professor Lynton to plead for a more comprehensive definition of research and scholarship was not neglect of undergraduate teaching but neglect, and indeed, denigration of "public service" -- another kind of teaching and dissemination of new knowledge. He put it in this fashion:

> "Ours is. . .a knowledge-intensive society, and there is enormous and growing need not only for data but even more for their analysis, and synthesis, for explication, technical assistance, and public information. . .I believe that it is extremely important, for the sake of our own survival as universities and also for the good of society, to recognize, evaluate, and reward dissemination of knowledge by means other than publication in refereed journals as parts of a broad spectrum of important scholarly activity."

What it is important for us to note at this Second Regional Conference on College Teaching is that Professor Lynton with his focus on the public service function of universities and AAC's Select Committee with their deep concern for improving undergraduate education are both saying that teaching, namely the interpretation and dissemination of knowledge for the purpose of stimulating understanding, is a major scholarly activity which is just as important and challenging as original research. With such a change in frame of reference, the old trite threadbare controversy about research versus teaching becomes transformed into a new, and I hope, more profitable, line of argument: How can the institutional attitudes and imperatives be changed to prepare and encourage faculty to fulfill all their professional responsibilities and duties as scholars and researchers? How can research be understood to include the interpretation and dissemination of knowledge, instead of merely achievements in only one narrow spectrum of scholarly activities.

The place to start in changing institutional attitudes and purposes is with the graduate schools. As AAC's Select Committee puts it in their report:

> "The Ph.D. degree is now awarded only on the basis of an evaluation of a candidate's research skills. If teaching in American higher education is to become more effective and responsible, the awarding of the Ph.D. degree should also mean that the candidate has been evaluated as a teacher and not found wanting, and that the formal experience leading to the degree has included appropriate instructions in the responsibilities of the profession of college and university teaching."

No one feels the need for such a change more poignantly than our better graduate students. Even twenty-three years ago, when I was Associate Dean of the Graduate Division at the University of California, Los Angeles, a half-dozen graduate students from departments in the sciences and social sciences came to me with a request for a non-credit course that would help them understand and prepare for the range of responsibilities which they would incur as faculty members and teachers on various kinds of campuses. The good news in this case was that Dr. Franklin Murphy, who was then Chancellor of U.C.L.A., granted me a few thousand dollars of his discretionary funds to pay for the expenses and stipends of guest lecturers like Louis T. Benezet, Wilbert McKeachie, and Robert Pace. The bad news was that even though the course proved itself to be both effective and popular, departmental directors of graduate studies would not allocate funds from their budgets to make it an on-going feature of the graduate program at U.C.L.A.

The lesson to be learned from this example -- even a quarter of a century later -- is that graduate schools should provide a course which introduces prospective faculty to the purposes and functions of all kinds of colleges and universities and to the varying roles and responsibilities of faculties within them. This should be offered early in the careers of graduate students and should bring home to them the crucial part that teaching plays in their scholarly profession. Among other things, it should develop an attitude that looks upon research alone. . .i.e. research without interpreting and teaching -- as an incomplete performance of professional responsibilities.

Yet, significant as such an innovation would be, it should only be the beginning. Besides developing a balanced attitude towards all aspects of faculty professional responsibilities, graduate schools can and should prepare graduate students for their faculty careers with more to guide them than the memory of inspired teaching in their own undergraduate days. Just as graduate schools can train students to be good researchers, so they can train them to be good teachers. Teachers, in other words, just as much as researchers, are made not born.

Graduate programs in teaching should cover two areas in particular. The first is a research area closely related to the specialized disciplinary fields of graduate study. The second involves training in professional methodology and practice.

The area of research to which I wish to call attention has been developing for more than a decade. It has been most vigorously pursued in certain disciplines of the natural sciences. It is directed toward discovering how students learn, or why they have difficulty in learning, physics, history, foreign languages or other subjects. Although it may sound as if this is research in the psychology of learning, it is not. It requires profound understanding of specific subject matters and is best conducted within the disciplines themselves. If departments in research universities made one or two appointments in each department to positions for research on learning in their various disciplines and then stipulated that graduate students should satisfy a requirement in that field for advancement to candidacy, they would almost inevitably bring about widespread improvement of teaching and the general dissemination of knowledge through public service.

In another way, graduate education could also better prepare Ph.D. candidates for their full academic scholarly careers. Just as graduate students are required to take courses in the research methods of their respective disciplines, so they might be obliged to receive training in their methods and practice of teaching. If research can be taught, so can that other scholarly activity which is such an important complement to research -- teaching or the dissemination of knowledge. Now I do not wish to be misunderstood. I am not advocating the kind of Mickey Mouse courses that have weakened the education of elementary and secondary school teachers. But in preparing graduate students to qualify as candidates for Ph.D. degrees, universities can assure that they fulfill requirements to learn about the basic elements of course design and development, about what various types of tests measure, and about how to teach so that their students develop not only a knowledge of facts but the power to think clearly about what they know and the ability to express themselves effectively. Furthermore, under the guidance of a careful mentor, experience as a teaching assistant could assist graduate students in improving the effectiveness of their classroom performance but also cultivate an understanding of the ethical principles and responsibilities of teaching.

What graduate schools would thus begin should be further developed in those colleges of universities in which the new teacher secures an appointment. The institutions of first employment should provide motives for career development as teachers that are just as strong as those encouraging faculty members to improve as researchers. There should be programs that encourage new faculty to enhance their teaching styles and to extend their intellectual reach and not just their disciplinary specialization. There should be opportunities to work closely and under the critical supervision of senior colleagues. And there should be no question that the reward system takes teaching as well as research into account. Perhaps practices such as "contracts" for professional development between institutions and their faculty members, reviews of instructional programs by external visitors, and recognition of successful teaching programs by learned societies would provide capstones for a new structure of respectability for college and university teaching.

To turn now to the second point. One note needs to be heard loud and clear: Improved college and university teaching is going to demand hard intellectual effort on the part of faculty members in order to redesign courses and curricula that will meet the needs of the general student as well as those of the major.

Here again we are faced with a question of attitudes as well as substance. Just as personal and institutional motivations for teaching are less than they are for research, they are also lower for teaching the general student than they are for teaching the major. As Professor Wayne Booth said in his presidential address to the Modern Language Association three years ago: "We do not care who teaches the non-majors, so long as the troublesome hordes move on and out. . .Give us lovers and we will love them, but do not expect us to study courtship." What is probably needed here is not only a realignment of institutional criteria for rewards and promotions but also a re-ordering of the system of values by which faculty members themselves arrive at their own personal sense of gratification and self-respect. They must come to see that providing sound instruction in their fields to non-majors takes imagination, mastery of intellectual skills, and profound understanding of their respective fields. Such talents are those of a genuine intellectual and are the equivalent, if they are not the same as, those required for original research.

Once faculty attitudes have changed, a lot of hard intellectual effort will still be required. To take courses in the sciences, for instance, persons like Arnold Arons, a physicist of the University of Washington, and John Moore, a biologist of the University of California, Riverside, have admonished their colleagues that first-year courses in science are not appropriate for the general student, and they both add, may not be optimum for majors. In the words of Professor Moore, they "tend to be fact- and vocabulary-laden and show little concern for concepts, broad issues of human importance, philosophical implications, and so on." Professor Arons has written:

> "We force. . .students into blind memorization by imposing on them, particularly at high school and early university levels, materials requiring abstract reasoning capacities they have not yet attained. . .And we proceed through these materials at a pace that precludes effective learning and understanding, even if the necessary reasoning capacities had been formed. They acquire no experience of what understanding really entails. They cannot test their 'knowledge' for plausible consequences or for internal consistency; they have no sense of where accepted ideas come from, how they are validated, or why they are to be accepted or believed. Students acquire the notion that knowledge resides in memorized assertions, esoteric technical terminology, and regurgitation of received facts."

And such problems are not restricted to the natural sciences. Professor Arons concluded with much justice: "This educational failure is by no means confined to the sciences It pervades our entire system, being equally manifest in the social sciences and humanities."

The kind of intellectual effort which rethinking courses and curricula requires has also been suggested by Arnold Arons. In an article published two years ago, he urged that faculty take nothing for granted and revise courses with a view to making them means for students to develop genuine awareness of their own intellectual processes as they acquire knowledge and develop an understanding of what they know. To illustrate, here are some of the challenges he issued to teachers as they redesigned courses in their subject matter fields:

a. Courses should consciously raise the questions: What do we know? Why do we accept or believe? What is the evidence for?

b. Courses should develop students' capacities to discriminate between observation and inferences and teach them how to know whether or not valid inferences can be drawn from data.

c. Courses should enable students to avoid being misled by technical jargon by teaching them to recognize "that words are the symbols for ideas and not the ideas themselves."

d. Courses should make students aware of the differences between inductive and deductive reasoning.

e. Courses should enable students to test their reasoning and conclusions for internal consistency and develop "intellectual self-reliance."

If scholar/teachers rethink courses and curricula along the lines suggested by Professor Arons, I am confident that they will also find a new and promising solution to the final problem: What kind of teaching will improve specialized education for the majors, even in technical, vocational, or professional fields? Professor Moore is of the same mind. After noting that introductory courses in science are "fact-and vocabulary-laden to a degree that leaves no time for the uniquely important features of sciences," he continued:

> "If one begins to make a list of the desiderata for a science course to be presented to students in the humanities and the social sciences, it soon becomes clear that such items are even more important for the scientist. Shouldn't the budding scientist enterprise, the logical and historical development of important scientific concepts, the enormous role of science in our economic and personal well-being, the excitement of discovery and verification based on the logical presentation of data and a deeper understanding of the natural world around us? All of this can be done within the framework of "real science. . ."

Another scholar, the historian Philip Curtin, from whom I quoted earlier has also expressed concern that premature and intense specialization in the seriously fragmented field of historical studies handicaps the apprentice historian. He believes that reconsideration of the way history is taught can improve education for majors as well as non-majors and restore balance between the depth of specialization and the wider interpretative framework that gives specialized studies meaning.

Now in conclusion: These remarks prompted by reflections on Whitehead's wise words about the purpose of universities will, I hope, have relevance to your deliberations at this conference and particularly to some sessions such as those this morning on "Training Knowledge Workers," or "Improving Skills of Teaching Assistants," or "Curricula for the Twenty-first Century." They may even have significance for discussions of "Active Learning" or "The Value of a Liberal Arts Education to the Professionally Trained," or "Identifying and Realizing Teacher Goals." For other meetings direct relevance may be less evident, but I hope you will find some sense in which this agenda for universities and their faculties will be helpful. I rely on your ingenuity. For myself, I am certain that reflection on the primary reason for the existence of universities and how the various programs and curricula relate to it can only strengthen the integrity and value of all that we strive to do.

TECHNOLOGY TRANSFER THROUGH TRAINING: EMERGING ROLES FOR THE UNIVERSITY

by

Harold M. Bergsma

New Mexico State University

Technology Transfer Through Training:

Emerging Roles for the University

Harold M. Bergsma

Ishtiag Qureshi, once Minister of Education in Pakistan, tells the story of efforts to incorporate training programs into economic development schemes soon after Independence, in the early fifties. He tried to persuade an official high in the government bureaucracy to agree to sponsor a plan whereby the Ministry of Education would apply for aid from an American foundation. The reply given to him was, "We should first satisfy the hunger of the poor, luxuries like education will come later." Qureshi reports for Pakistan what was true for many developing countries in the fifties and sixties, in fact in many cases, up to the present.

Economic planners frequently looked on education and training as almost irrelevent in the entire processs of ecomonic development. During the past twenty Years, particularly in Africa, development plans did not bear fruit as many had hoped. Predictions for change did not, in many cases, work out as expected. People in the third world frequently accepted the artifacts of technology, but were unable to use and maintain these optimally. Economic growth was tied to political realities and those elites who were influential in maintaining their own status. Economic development was rooted on its "source of inspiration", to use Qureshi's words, "...the manpower to bring about and establish development" (Qureshi, 1975, p.218).

The last twenty years has been characterized as an era of technology transplant, as opposed to an era in human resource development. Communication systems in rich countries advanced rapidly with other

Communication systems in rich countries advanced rapidly with other technologies. These systems, in their advanced forms, including television, radio , computers, telephones, newspapers and movies were introduced into undeveloped countries rather early in the development process. These became necessities for the elites. Soon the poor countries were bombarded with information about ways of life elsewhere and the living styles of the wealthy. With their own eyes people saw how the rest of the world lived and made comparisons about their own life styles and obvious deprivation. Isolated poverty was tolerable when people had no comparisons and believed that their way of life was normative. Even the idea of others was rather foreign to the isloated village man. But placed side by side, very rich and the very poor, prosperity and poverty, and a politically dangerous situation emerges. Political change in the third world has been rapid and frequently violent as evidenced in South America and Africa.

The highly complex process of economic change and development was tied to the general standard of living and educational levels of the people. However these standard and levels were not evenly spread. In practically every developing country the gap between the poor and rich grew wider. In Pakistan this gap was seldom bridged with communications and attempts at social integration between the rich and poor, rather the development process polarized the communities into distinct classes. Rich and poor nations, during the past twenty years have similarily developed gaps. The richer nations, because of highly developed economic structures, have accelerated and developed their supporting technologies based on high levels of literacy and availability of general education for the majority of their people. Poor nations on the other hand, lacking sophisticated infrastructures, went farther behind comparatively. The elites at the top who had received good educations in universities abroad, received not only power, but managed the economies within the political structures in which they worked. Conversely rich countries experienced the development of an affluent middle class who became eager consumers of new inventions. In poor countries the middle class was frequently very small. The masses remained in poverty, living on the land, subsisting, but not able to enjoy the benefits of a middle class which was consumption oriented.

Economic development seen in this framework is certainly a complex process since humans and the resources available to them are a vital aspect of stability and change. Consequently planners in the eighties are far more cautious and wary of simplistic development solutions, and of being too hasty with the introduction of technologies which can not be supported by poor countries. Experts working in foreign development settings come with their pockets bulging with technological know-how and equipment to do the job. Their biggest challenge relates to dealing with people, educating and training, so that the very technology they introduce becomes sociallly functional.

Farmers are now the target for international aid in most developing countries. It is now well understood that any development of an industrial structure must have as its support system, an agricultural structure which can feed the people and raise the standard of living of the population. Strategies toward this end are now being suggested. A recent publication, Promoting Economic Development in Central America, states:

> "The broad strategy is: First to arrest the declines in incomes, employment, and economic activity by means of major balance-of-payments assistance: Second, to lay the foundation for

long term economic growth and the infrastructure necessary for export orientations. Third, to assure the widest possible distribution of the benefits of growth through assistance for improving health, education, and housing for the poorest groups; and Fourth to support democratic processes and institution through assistance for the administration of justice, and technical training, and the development of leadership skills" (McCormack, 1985).

Concomitant with such plannning comes development interruptions in the form of huge famines in Africa, frightening refugee problems in Afghanistan, Western Sahara, South and Central Africa. (Gist, 1985) Africa's growing dependence on foreign aid, along with many other third world countries, creates additional interruptions in the attempts to bring development assistance in a way that recipients can support. John C. Whitehead (1985), Deputy Secretasry of State, outlined a proposal which is a coordinated attempt to bring various international donor groups together to help solve the growing world crisis of hunger particularly in Africa. Included in his plans are ways to help people to help themselves, to educate, to train and to provide long-term educational programs, sector-wide in their scope.

Literacy education is a feature of most development plans. Along with development of the agricultural sector to support industrial growth, are efforts made to increase literacy rates. Qureshi's story again comes to mind. It is important to satisfy the 'hunger of the people' first, but general development involves an integrated and complex interaction between people and technologies, between satisfaction of the hunger for more information and more knowledge and improved health.

Eric Ashbey (1962), the author of the well-known Ashbey Report, was concerned with drawing up a manpower development plan for Nigeria. His writing was infused with the idea that education was the leaven for economic development. Education had to occur simultaneously with economic planning and the introduction of new technologies. Another economic expert at this time was Harbison who argued in the Ashbey Report (1964) that "a plan for economic development must consider available resources of man power trained to different needed levels and must make provision for such education and training" (p. 227). Underdeveloped countries at that time faced a special problem. They had a limited educational base and a limited industrial support system. Training manpower for absorption by the economy was frequently an unpredictable and delicate affair. An over emphasis in one area could result in imbalance and dysfunctional programs. Formidable expansion of secondary grammar schools and educational facilities was the mood of the Sixties (Bergsma, 1978). Most of these schools today, in the eighties, are in shambles.

In highly developed countries the sheer mass of the educational and the industrial system insured that adjustment could be made fairly readily to supply manpower to be absorbed by the developing technologies. In less developed countries it was found that there was the danger of over production of people whose education did not match national need. Highly trained people who could not be absorbed into a limited industrial/technical sector in the third world became unemployed. In one sense, a person who was a technician but not employable was worse off than a coammon laborer looking for work.

Forecasting what type of person would be needed to support developing industries became the hazardous job of planners, particularly planners who suggested changes in educational systems. In Pakistan, manpower planning for training occured very late. Vocational technical training programs there are now realistically in their infancy. New technical schools require large capital investments for machinery and equipment. The machiney must be up-to-date and similar to what is used in industries. Funding needed to establish new institutions is simply not available. One need but travel from one technical training school to the next in Pakistan, to see how poorly equipped these institutions are. Shops are meagerly equipped and many tools are in disrepair. "The record of Pakistani industry in the maintenance of machinery has been very poor. In many instances its main cause has been the lack of training and skill among technicians" (Qureshi,1975, p. 222).

Manpower training requires tools . Lacking tools, training tends to become purely theoretical and non-experiential. Two or three generations of graduates who are trained without learning adequate skills dilute the entire system. Standards go down rapidly. Frequently one way out is to seek another injection of foreign aid to boost the system for a while.

In many instances training of trainers is not a central aspect of the foreign aid package. Simplistic solutions have not worked. Short term plans to "put out brush fires", leave the land scorched and arid. For instance, in the process of training technicians it is important to remember that these people have a need to be broadly educated so that they have some understanding of their own society and its needs and a sense of personal responsibility to carry out tasks in functional ways. A narrow vocational training especially in the early phases of development is likely to be unproductive. Phillip Foster (1975) discusses this action well in much of his writing. His article, "The Vocational School Fallacy in Development Planning", reviews what occured in India. Educators developed technical training programs which put hundreds of children at spinning wheels and looms. Not only did such programs fail to remove the cause of poverty by such training, a feeling of hopelessness was generated among those so trained.

It may be argued that the major concern of most developing countries is not to bring in sophisticated science and industry, rather to raise the standard of living sufficiently so that poverty is reduced and the general standard of living of the masses rises. Economic development in this frame of reference, requires continual attention to the development of training systems in all sectors related directly to the capability of countries to sustain this growth. Development in this sense is evolutionary, gradual and tied to on-going structures which exist in the societies in question. Development requires sustained time to occur.

W. David Hopper defines the development process as one in which "the pile of goods available to a population is increased at a pace much in excess of the traditional rate of growth or output" (1984, p.11). He goes on to state that development as he sees it is the "problem of engendering and supporting the transformation of the technological basis of production for Neolithic people, who were primarily dependent upon traditional agriculture and Agrarian techniques, to methods based on modern science and technology. This transformation is the core of today's development concern" (p. 13). Planning for training has its genesis here, the development of functional educational systems which allow for learning new ideas and developing knowledge to unleash new technologies. Another way to say this is that investment in human capital, building people, is the arch stone of the development process.

Educational Technologies for Development

An American university professor working as a technical expert for a World Bank project in Pakistan a few years ago, was asked to help provide training to nationals in his area of expertise. His reply was, "Training is not on my terms of reference and is not on my job description. Sorry, I am here as a technical expert, not a trainer." Don Dwyer, the Executive Director of the Consortium for International Development, mentioned in his speech given here at New Mexico State University in December of 1985, that our technologies and expertise is assumed when we go abroad. Our major task will be to educate, to teach and to train people. Universities are dedicated to this mission and therefore universities should have a central role in human resource development.

Institutions of higher education in this country are being requested to participate in the technology tranfser process abroad at an ever increasing rate. The expertise within these university systems is vast, impressive and flexible. Through the U.S.- A.I.D., World Bank and Asian Development Bank, among others, vast development proposals are being planned and funded. These proposals are frequently being staffed by university professionals. A tremendous challenge exists for these agents of change to consider the best possible means to introduce technical systems abroad. For technical educators, professionals in universities, a great professional challenge exists to become involved with foreign technologists and scientists in designing curriculum and training systems which will optimize the way people learn and adapt to new ways of living. Training people for productive work will require the attention of such teams working together to bring about change.

References

Ashbey, E. (1964). *African Universities and Western Tradition*. Cambridge, Mass: Harvard University Press.

Ashbey, E. (December, 1962). Mission and challenge of West African universities. *Teachers College Record*, 227-230.

Bergsma, H. (1978). *Education for International Development: Problems for Planned Change*. Dialogue Series, New Mexico State University.

Foster, P. (October, 1975). Dilemmas of educational development: What we might learn from the past. *Comparative Educational Review*, 378-402.

Hopper, D. (1983). New horizons for education in international development. *Proceedings of Presidential Symposium: New Horizons for International Development*, Consortium for International Development, Arizona.

McCormack, R. (1985). *Promoting development in Central America* (Current Policy No. 759). Washington DC: Department of State, Bureau of Public Affairs.

Qureshi, I. (1975). *Education in Pakistan*, Karachi, Pakistan: Ma Aref Ltd.

Whitehead, J. (1985). *The African Crisis* (Current Policy No. 757). Washington DC: Department of State, Bureau of Public Affairs.

CURRICULA FOR THE TWENTY-FIRST CENTURY

by

W. Brock Brentlinger

Lamar University

CURRICULA FOR THE TWENTY-FIRST CENTURY

Robert Theobald contends that the study of problems whose solutions are known is training, while the study of problems whose solutions are unknown is education. Using such a distinction between "training" and "educating," it is not unreasonable to estimate that approximately one-half of our university and college undergraduate education falls under the category of "training"--the simple presentation of facts and solutions. It is the thesis of this paper that such a situation must be altered as we prepare the curricula for the 21st-century

It is interesting to note that the students who entered our programs this past fall, and who begin their careers immediately upon graduation, will spend approximately 75% of their professional lives in the 21st-century. Our task, then, is to prepare them now for this experience.

It may be absolutely foolhardy, Arthur Levine says a "guessing game," to predict what will happen to the university curriculum over the next fifteen years. On the other hand, perhaps it is not so difficult at all given our penchant to resist change. Phillip Coombs claims that a global photograph of all of the world's schools, colleges and universities on any given day in the early 1980's would reveal a picture which would look almost exactly the same as that taken ten, twenty or thirty years ago. We are still faced with the traditional pessismistic attitudes about curricular change, for example, the words of one anonymous commentator of the past: "The curriculum does not matter. If it did matter, we could not do anything about it. If we could do something about it, we would not know what to do."

We can ill afford to cultivate attitudes such as this in light of the tremendous changes occuring in our society and especially in light of those to come. It may be as difficult as the old bromide suggests that it is easier to move a cemetery than it is to move the faculty to change the curriculum, but if the university is to remain meaningful and resonant with society as a whole, there is no other choice.

The problem of designing a curriculum for the future is additionially complicated, because as Paul Valery reminds us "the future is not what it used to be." We have been warned by Alvin Toffler, John Naisbitt and a host of others about the frightening future whereby we will be overwhelmed by change and experience shocks of various natures. So today we confront a double problem of trying to figure out what's in the future and then devising a curriculum that meets these contingencies.

Later in this paper, it will be necessary to speak more extensively about some of the changes our modern-day prophets are predicting for the future, but for the moment, let's take a quick look at where we are today in reference to the curriculum in higher education. James Hall, the president of Empire State College in New York, doesn't.seem to think that we are in a very good position. "As the ninth decade of this century begins," he says, "educational institutions are floundering in an identity crisis. Shaken by a decade of rapid changes in students, curriculum, and budgets, American colleges and universities are seeking to regain the stability and clarity of the past by reassessing the questions: 'What is an educated person?' and 'How best can educational institutions arrive at socially and intellectually responsive curricula for today's world?'" A 1979 Gallup Poll on education expressed a declining confidence in schools, which led John Naisbett to comment: "For the first time in the nation's history, adults considered themselves better educated than young people." Toffler says that what passes for education today even in our best schools and colleges is a "hopeless anachronism." He claims our schools are facing backward toward "a dying system, rather than a forward emerging new society," that too much of our energy is generated on "cranking out industrial men," people who are prepared only for survival in a system "that will be dead before they are."

In the past few months we have been made aware of three major national reports on higher education, all of which have come to remarkably similar conclusions about the state of undergraduate education in this country. All have singled out an incoherent curriculum as part of the problem. One of these studies, the American Association of Colleges Report Redefining the Meaning and Purpose of the Baccalarueate Degree, claims that almost anything goes now in the typical college curriculum, that we are more confident about the length of the curriculum than its content and purpose. The report reads: "There is so much confusion as to the mission of the American college and university that it is no longer possible to be sure why a student should take a particular program of courses."

Obviously, then, there is considerable discussion today about the need for curriculum revision. Before we talk about particular change in the curriculum, especially so as to prepare our students to work and live successfully and effectively in the 21st-century, let's return for a moment to the discussion about the future and the tremendous change which our modern-day prophets say is in store for us.

Time and time again in discussions about education and the future, we are told that more learning will occur outside of the classroom, and a significant amount of that in the home, that occupational skills will need to be revised every few years, that compulsory schooling time may be shortened, that life-long learning abilities must be a characteristic of the future, that more and more work will move out of the factory and the office intb the community and into the home (Toffler, in his book Third Wave, suggests, by the way, that the factory whistle will vanish and the clock will lose its power), and finally that there will be a tremendous amount of diversity in opposition to further standardization in our lives.

Obviously, an expanding communication technology is at the base of this new age wherein we will be making the shift from smokestack industries to information and service-oriented industries. John Moseley suggests that "as we visualize the turn into the 21st-century, we will have had the information explosion and the development of communication technology that makes tremendous amounts of information available to the individual. Peter H. Wagschal, director of the Future Studies Program at the University of Massachusetts, claims that we will soon witness "the demise of the written word as our primary means of storing and communicating information." Perhaps one of the most radical predictions of the future affecting education is that of educational consultant Ronald E. Barnes who imagines a social historian speaking to educators in the year 1996 in these words:

> We have moved from a book-centered curricular approach to the utilization of unlimited learning resources. Clearly we rely less on books today than we used to. It is a poverty-stricken classroom that does not use open and closed circuit TV, community resource people, films, tapes, and many other resources... Texts went out in the late eighties, I believe, when we finally understood that since all students are unique and different, they need not begin at the same place and end at the same place in a set amount of time.

We will also face the continual changes requiring coping skills, possibly dealing with options of space frontiers and the new understandings and adaptations necessary to contend with instant communication and travel. We are already seeing the need for a greater understanding of world cultures and languages and this is to become a more universal educational requirement of the future.

Our government is presently experimenting with hypersonic aircraft which will mean that no major city of the world will be more than two to three hours away. Toffler believes that the new technology of tomorrow will require not "millions of lightly-lettered men, ready to work in unison at endlessly repetitious jobs...but men who can make critical judgments, who can weave their way through novel environments, who are quick to spot new relationships in the rapidly changing reality. It requires men who in C. P. Snow's compelling term, "have the future in their bones." John Naisbitt, author of Megatrends, contends that these rather dramatic changes in the future simply mean that we are "moving from the specialist who is soon obsolete to the generalist who can adapt." It is no longer sufficient, Toffler adds, for Johnny to "understand the past or even the present... Johnny must learn to anticipate the directions and rate of change--learn to make repeated, probabilistic increasingly long-range assumptions about the future--and so must Johnny's teachers."

We are all becoming conscious of characteristics in our society which appear to back up these claims of a knowledge explosion, estimated to double the amount of information available in the world every five years, bringing radical shifts in occupations and in education. About 8,000 types of jobs disappeared from the United States labor market from 1949 to 1965, essentially because of the spread of automation. At the same time, about 6,000 new jobs developed. In 1950, 17% of the population worked in jobs related to information, and now in the early eighties approximately 60% of us work as programmers, teachers, clerks, secretaries, accountants, stock brokers, etc. involving a great amount of information transfer. By the year 2000, it is estimated that 86% of all jobs will be in the service sector. Within this present calendar year, one estimate claims that 75% of our jobs involve computers in some way.

Can we in higher education respond as quickly as we should to these approaching shock waves of the future? We do not have a very good track record for fast change in the higher education curricula. Obviously what is needed today is a most fundamental change in the curriculum which will have major impacts upon the education of our young people. One of the greatest problems in this regard may be in getting the faculty's attention and commitment toward curricular change. I think we are all aware of the difficulty of getting the faculty to read and think about educational issues. For that matter, deans and department heads may not do much better. We frequently enter curricular meetings determined only to protect our own turf and specialties.

Though curricular review and reform is not easy, we live in a day when there is no choice. We will soon be literally forced to make some rather important changes in the curriculum to ready our students for work in the next century. What, then, are some specific guidelines for curricular change that the future demands of us?

I wish to call your attention to a few basic principles which should be at the very base of any curricular change which looks toward the future. You may note that there is a common thread running through most of these principles and that is: contending with the concept of change. We simply must prepare our students for an adaptive mode of living and learning in a time when jobs will change drastically every 5 to 10 years, where people will be displaced frequently and more constantly from one occupation to another. We will need to alter the belief that one's formal education should be completed by age 25. In Future Shock, Toffler says he is appalled by "how little is actually known about adaptivity, either by those who call for and create changes in our society, or by those who supposedly prepare us to cope with these changes." He believes that those of us within the ivy walls who talk so bravely, as we are here today, about "educating for change," and "preparing people for the future," know virtually nothing about how to do it. I'm not sure that there are many of us in this room today who are prepared to answer that charge. It is time for us to learn more about educating for change.

How do you educate for change? As I read the literature on revising the curriculum to meet the demands of the future, it appears to me that there is quite a bit of agreement upon several criteria by which one should judge such a curriculum so claiming to prepare students for life in 21st-century America.

1. Do the skills of decision-making, problem-solving creating, evaluating, analyzing and acting take precedence over the acquisition of facts?
2. Are students educated to contend with problems which do not now exist; learning to deal with the unknown; able to structure problems to grasp what the result will be, and will they be equipped for change?
3. Is attention given in the curriculum to how knowledge has been created, to the methods and styles of inquiry which have led to its creation; in short, is there emphasis on the "how," allowing the culture of the time to decide the "what" that is important to it?

4. Is there provision for a great amount of individuality within each student's degree program which may mean some movement away from a standardized, rather fragmented series of required subjects?

5. Is each student taught how to classify information, to evaluate its veracity, how to change categories when necessary, and to move from concrete to abstract and back, how to synthesize information in realistic ways?

6. Will the student have learned how to learn upon graduation, having found somewhere in the experience of education a "life know-how"?

7. Is there a recognition of the coming leisure society which may place more emphasis upon interpersonal relations, human development and the dignity of man?

As we discuss the characteristics of life in the 21st-century and learn of the tremendous technical expansion, it may appear that tensions may occur in the curricula of higher education between the humanistic and technological emphasis. This need not be. In fact, both of these points of view are crucial for an educated person in the 21st-century. Fred Hechinger of the New York Times points up the harmonizing relationship which must occur between these two philosophies:

> The visions of brave new electronic worlds of microchips and robots raise simultaneous demands for a schooling that looks to the future by learning from the past. Yes, the computer must be mastered by all, regardless of race, sex and economic condition. But at the same time...the computer must be mastered by young people who are secure in a broad understanding of what used to be called general education--including language, history, economics, mathematics, science, the arts; in short, the human condition.

How much time do we have to make these changes? I would remind you again that our present students are going to be applying their present learning, for the most part, to the 21st-century. Stephen Bailey, in his book entitled The Purposes of Education, maintains that few colleges and universities "have addressed themselves to the range of individual and society needs that characterize even the existential realities of the last decades of the 20th-century," for example, the need of life-long learning, the need for increased attention to "mastery skills" to overcome the draining anxieties of existential coping, the need to educate people in the negotiating arts, and "the need to help people have a truly creative engagement with the taunting and frequently fretful world of the free self." Ralph Tyler puts it this way: "you can tell you are educated if your options are increasing." This has to be of crucial concern for the student in the future, keeping his options open; a readiness to adapt using new skills as a result of the rapidly changing character of the world of work.

AN ANALYSIS OF STUDENT EXPECTATIONS REGARDING CONCEPTS OF TEACHING FORMAT

by

Edsel Buchanan

University of Nebraska at Omaha

AN ANALYSIS OF STUDENT EXPECTATIONS REGARDING CONCEPTS OF TEACHING FORMAT

Edsel Buchanan, University of Nebraska at Omaha

Introduction: Faculty perceptions and attitudes toward teaching formats are significantly important to the development of good teaching. It is critical that perceptions of a format and the student be as accurate as possible. Substantial research has been conducted in the general area of instruction (Aleamoni, 1976; Ladd and Lipset, 1975; Perry, 1970). The diversity of the research within the literature suggests that instructional design has been thoroughly investigated; however, teaching evaluations continually suggest that the teaching/learning process within undergraduate education can be improved. The following six formats were selected for the study: LECTURE - presented by an instructor with little or no student-professor interaction. Essentially a one-way communication. The class may be large or small. DISCUSSION - the topic is controlled by an instructor with the majority of all speaking coming from the students. LABORATORY - the session is controlled by an instructor who explains performance requirements of the student. This is a practical, hands-on, performing situation. PERSONALIZED - the student is directed on a one-to-one basis with heavy use of course materials (not tutoring). All requirements of learning are mastery or competency based. Is individually paced and may be structured in module form. COMPUTER-ASSISTED - the student is expected to work/study on his/her own accord with essentially all assistance being limited to a computer/computer program. TELEVISION - the television session informs/directs the student without any personal contact and without any verbal interaction. The class may be large or small.

Methods: A representative sample (432 undergraduates) of students was requested to respond to a semantic differential questionnaire. Demographic data was collected to include: classification, overall grade point average, sex, age range, general area of study (1. Social Sciences/Humanities, and 2. Science/Subject Matter). Data analyses were appropriate statistical applications of Cross Tabs with Chi Square, Factor Analysis, Univariate F-tests, and Multiple Tests of Significance. Level of confidence was set at .05.

Results: Chi Square analysis revealed statistical significance in two areas; GPA and Age Groups. Analysis for Sex by GPA (Table 1) revealed significance at the 0.0029 level. Analysis for Sex by Age Group (Table 2) revealed significance at the 0.05 level. Seventy-three plus percent (73.8) of all respondents were found to be within the two youngest age groups. Seventy-seven percent (77.0) of the males were within the 19 to 22 age ranges with only 70 pecent of the females within the 19 to 22 age ranges. F-tests for the demographic variables (Table 2) found significance for GPA at the 0.003 level. This was additionally confirmed with three tests for significance at the 0.007 level.

Factor Analysis revealed three factors for each format (Table 3). For each format, Factor 1 was Evaluative with characteristics of "goodness/badness," "preference," and is "connotative." Factor 2 was Potency with the characteristic of "ascribed strength." Factor 3 was Activity with characteristics of "intenstiy" and "direction." Loadings for Factor 1 across all formats suggest that all were good. Loadings for Factor 2 across all formats reveal a variety of intensities for Potency. Lecture, Personalized, Discussion, and Computer-Assisted formats elicit a positive, but lower-level of intensity. Loadings for Factor 2 of Television suggest that TV does not elicit a positive intensity. Loadings for Factor 2 of the Laboratory format suggest an almost neutral intensity. Loadings for Factor 3 of the Lecture format suggest that Lecture is a format connotating a preference with acceptable limitations. Loadings for Factor 3 suggest that Discussion is a format connotating a positive, but lower-level preference. Loadings for Factor 3 of the Television format and the adjectives loaded at .400 or greater suggest little direction and intensity. Loadings for Factor 3 of the Laboratory format suggest a limited intensity and direction. Loadings for Factor 3 of the Personalized format suggest a positive intensity and direction. Loadings for Factor 3 of the Computer-Assised format suggest a low-level intensity and direction.

Discussion: The Grade Point Average (GPA) of males was significantly less than the GPA for females. The majority of the sample for both sexes was distributed within the two youngest age categories, and this, along with findings for sex by age group, suggests that GPA differences are located at the freshman level primarily; freshman/sophmore levels collectively. There were no findings of significance for sex by year and for sex by major area of study. GPA was the one variable clearly suggesting significant differences. The age group variable, although significant, may be viewed as having a closer relationship to GPA than any other study variable. TEACHING FORMAT - The data clearly suggest that all formats were viewed as positive (good). This goodness is deceiving, however, unless viewed along with Potency and activity. Lecture loaded for Evaluative, and was seen as having a good level of ascribed feeling. Activity loadings clearly suggest that lecture may be preferred for a variety of reasons, but it is an impersonal and passive format. Discussion loaded positive for Evaluative and was seen to exhibit a low-level of ascribed feeling. Activity loadings were limited and suggest that the personal nature of the discussion format restricts it as a strong preference.

Television loaded positive for Evaluative, but was seen to exhibit a clear negative intensity. For Activity, only two loadings were exhibited and both are indicative of little direction and intensity. TV is clearly a non-preferred format. Laboratory loaded positive for Evaluative and was seen to exhibit only two Potency loadings which suggest a neutral intensity. Three Activity loadings suggest some direction and intenstiy, but clearly not strong.

Personalized loaded positive for Evaluative, and was seen to have a clearly positive ascribed feeling. Two loadings found for Activity were strong and suggest a preferential intensity and direction. Computer-Assisted loaded positive for Evaluative, but was seen to elicit mixed loadings for Potency (2 pos, 2 neg). Ascribed feeling for the format is weak. Three loadings for Activity were mixed (2 pos, 1 neg) and the nature of the adjectives suggests a positive, but low-level of intensity and direction.

Formats viewed as preferences were "personalized" and "lecture." The "discussion" format was suggested as a "third choice", with reservations possibly because of uncertainty with instructor expectations and the student's ability to express him/her self. Laboratory and Computer-Assisted are seen as worthy, but eliciting weak feelings of Potency and Activity. Television is clearly a non-preferential format. The ability of an instructor to effectively utilize a given format may be the key in helping convince students of the desirability of any given format. This would suggest that an instructor must be skilled in the use of any format selected as a delivery mode.

TABLE 1

Cross Tabulation of Sex by Grade Point Average

Sex	3.6-4.0	3.0-3.5	2.6-2.9	2.0-2.5	1.9-0.0	No GPA	
Male	28	61	73	58	7	20	247 56.8
Female	29	72	49	24	1	13	188 43.2
Column Total	57	133	122	82	8	33	435
Per Cent	13.1	30.6	28.0	18.9	1.8	7.6	100.0

$x^2 = 18.06$; d.f. 5; significance = 0.0029

Cross Tabulation of Sex by Year In College

Sex	FRESHMAN	SOPHMORE	JUNIOR	SENIOR	
Male	79	59	67	43	248 56.8
Female	56	53	39	41	189 43.2
Column Total	135	112	106	84	437
Per Cent	30.9	25.6	24.3	19.2	100.0

$x^2 = 3.78$; d.f. 3; significance = 0.2854

Cross Tabulation of Sex by Major Specialization Area

Sex	SOCIAL SCIENCE	SCIENCE ORIENTED	
Male	169	76	245 57.0
Female	137	48	185 43.0
Column Total	306	124	430
Per Cent	71.2	28.8	100.0

$x^2 = 1.08$; d.f. 1; significance = 0.2972

TABLE 2

Cross Tabulation of Sex by Age Group

Sex	19-20	21-22	23-24	25-26	27 AND OVER	
Male	126	63	26	13	18	246 56.6
Female	98	34	19	9	29	189 43.4
Column Total	224	97	45	22	47	435
Per Cent	51.5	22.3	10.3	5.1	10.8	100.0

$x^2 = 9.25$; d.f. 4; significance = 0.05

Univariate F-tests, and Multivariate Tests of Significance for Sex by Years In College, Age Group, Grade Point Average and Major Specialization Area

Univariate F-tests

Variable	MS	F	Sig. of F
YEAR	.22233	.18160	.670
AGE	5.89015	3.27607	.071
GPA	16.89187	8.91955	.003
MAJOR	.63061	1.68606	.195

Multivariate Tests of Significance

Test Name	Value	Approx. F	Sig. of F
Pillais	.03223	3.59666	.007
Hotellings	.03330	3.59666	.007
Wilks	.96777	3.59666	.007

TABLE 3

Factor Analytic Solutions Rotated To The Varimax Criterion (COVARIMIM) For The Six Teaching Formats

Adjective Pairs	Lecture			Discussion			Personalized		
	F1	F2	F3	F1	F2	F3	F1	F2	F3
1. Good-Bad	.703	-.167	-.080	.582	.417	.144	.711	-.312	.001
2. Easy-Difficult	.548	-.293	.279	.460	.409	.441	.488	-.213	.623
3. Undemocratic-Democratic	.368	.437	.257	.453	-.571	-.079	.551	.463	-.165
4. Stale-Fresh	.570	.499	.164	.627	-.511	-.051	.670	.407	-.013
5. Reliable-Uncertain	.623	-.361	-.071	.531	.414	-.262	.650	-.331	-.114
6. Inferior-Superior	.503	.290	.418	.739	-.195	-.010	.704	.294	-.114
7. Successful-Unsuccessful	.692	-.374	-.017	.656	.449	-.074	.657	-.398	-.073
8. Complex-Simple	.390	-.118	.495	.345	-.127	.489	.396	.165	.716
9. Fast-Slow	.255	-.166	.001	.370	.331	-.176	.433	-.244	.191
10. Restrained-Free	.434	.523	-.084	.568	-.568	-.018	.521	.497	.013
11. Unpleasant-Pleasant	.659	.371	.045	.686	-.295	-.153	.705	.357	.053
12. Efficient-Inefficient	.597	-.457	-.105	.614	.431	-.254	.598	-.421	-.151
13. Personal-Impersonal	.408	.220	-.594	.333	.014	.622	.578	-.269	-.264
14. Strong-Weak	.626	-.355	-.264	.639	.427	-.065	.671	-.321	-.060
15. Passive-Active	.382	.506	-.404	.560	-.568	-.036	.639	.346	-.202
Per Cent of Total Variance	28.5	13.4	8.1	31.2	17.1	7.0	36.8	12.1	7.6

F1: Evaluative; Preference; Connotative
F2: Potency; Ascribed Strength
F3: Activity; Intensity Direction

TABLE 3 (Continued)

Adjective Pairs	Computer-assisted			Television			Laboratory		
	F1	F2	F3	F1	F2	F3	F1	F2	F3
1. Good-Bad	.713	-.149	.167	.688	.328	-.129	.646	.077	-.244
2. Easy-Difficult	.597	.154	.468	.608	.335	.203	.517	.352	.403
3. Undemocratic-Democratic	.520	.313	-.213	.625	-.406	-.009	.600	-.249	.293
4. Stale-Fresh	.614	.215	-.243	.721	-.393	.052	.666	-.387	.178
5. Reliable-Uncertain	.549	-.511	-.016	.564	.367	.185	.636	.200	-.077
6. Inferior-Superior	.591	.101	-.496	.726	-.256	.049	.721	-.286	.205
7. Successful-Unsuccessful	.705	-.373	.090	.749	.335	-.078	.687	.221	-.296
8. Complex-Simple	.409	.414	.487	.472	.128	.739	.277	.594	.470
9. Fast-Slow	.635	-.125	.214	.454	.201	-.508	.504	.393	.143
10. Restrained-Free	.507	.456	-.186	.575	-.493	.034	.574	-.207	.268
11. Unpleasant-Pleasant	.694	.136	-.142	.785	-.306	.106	.710	-.109	.124
12. Efficient-Inefficient	.642	-.451	-.015	.641	.406	-.004	.663	.152	-.335
13. Personal-Impersonal	.508	.339	.269	.664	-.007	-.150	.515	.087	-.433
14. Strong-Weak	.719	-.199	-.013	.745	.317	-.216	.658	.138	-.328
15. Passive-Active	.557	.082	-.286	.585	-.489	-.179	.522	-.575	-.046
Per Cent of Total Variance	36.5	9.2	7.3	42.0	11.7	6.8	36.5	9.7	8.1

F1: Evaluative; Preference; Connotative
F2: Potency; Ascribed Strength
F3: Activity; Intensity Direction

References

Aleamoni, L.M. "Typical Faculty Concerns About Student Evaluation of Instruction," NACTA Journal (National Association of Colleges and Teachers of Agriculture), March 1976, pp. 16-21.

Gorsuch, Richard L. Factor Analysis, second edition, Hillsdale, New Jersey, Lawrence Erlbaum Associates, Publishers, 1983.

Improving College and University Teaching, Heldref Publications, 4000 Albemarle Street N.W., Washington, D.C., 20016.

Kerlinger, F.N. and Pedhazur, E.J. Multiple Regression in Behavioral Research, New York: Holt, Rinehart, Winston, 1973.

Ladd, E.C. and Lipset, S.M. "How Professors Spend Their Time," Chronicle of Higher Education, October 14, 1975.

Millman, Jason, editor, Handbook of Teacher Evaluation, National Council on Measurement in Education, Sage Publications, 275 South Beverly Drive, Beverly Hills, California 90212.

Perry, W.G., Jr. Forms of Intellectual and Ethical Development in the College Years, New York: Holt, Rinehart, Winston, 1970.

Snider, J.G. and Osgood, C.E. Semantic Differential Technique: A Sourcebook, New York: Aldine-Atherton, 1972.

TRAINING KNOWLEDGE WORKERS: A NEW PERSPECTIVE ON GRADUATE EDUCATION

by

Paulette Chaffin

University of Wisconsin

and

William Ammentorp

University of Minnesota

TRAINING KNOWLEDGE WORKERS:
A New Perspective On Graduate Education

Paulette Chaffin
University of Wisconsin
River Falls, Wisconsin

William Ammentorp
University of Minnesota
Minneapolis, Minnesota

ABSTRACT:

Professional practice in an information society differs substantially from the work of doctors, engineers, and administrators in the past. The explosive growth of knowledge and advances in technology create a turbulent environment in which the modern professional must find ways to acquire new knowledge and skill on a continuing basis. These developments have made many forms of professional training obsolete and have set programmatic demands which many institutions have been unable to meet.

This paper describes a non-traditional approach to professional training at the graduate level. Studies of professional practice are referenced to identify educational requirements for health and human service practitioners. Using a knowledge worker perspective, these requirements are translated into a professional education/learning environment in which the knowledge base of a given field interacts with the technology of practice.

Examples from on-going non-traditional programs in health and human service administration and telecommunications management are used to illustrate the education/learning design. Special emphasis is given to the interaction of training and practice and the role of the professional knowledge base in career development. The paper also makes a case for the use of information science technology as the core for a training delivery system.

THE NATURE OF THE ADULT LEARNER

Demographic changes in higher education are creating a new population of students, one which is older and more experienced. The number of American adults over 25 years of age who are returning to colleges and universities is increasing annually. At the same time, the population of traditionally aged students is experiencing a decline. This has an inevitable impact on the student population as a whole. Between 1974 and 1979, students on the nation's campuses between the ages of 25 and 30 increased by 26 percent; students between the ages of 18 and 24 years increased by ten percent (National Center for Educational Statistics, 1980). Hill, et.al., (1982) report that, in 1982, adults accounted for over 41 percent of the total college enrollment in the United States.

By and large, these students have been viewed from traditional perspectives by educators. Thus, teachers and administrators have attempted to fit the adult learner into programs designed for the younger.full-time student. When any new approach has been attempted, it has frequently been characterized by examination of the social and personal correlates of academic performance among adult or professional students. (Cross, 1981; Morstan and Smart, 1977) These ways of looking at the adult learner can be shown to be of marginal value in assisting institutions in creating programs to meet the needs of working professionals. (Chaffin, 1985)

If institutions of higher learning are to respond appropriately to the emerging demand for adult programming, new models of students and subject matters must be devised. Perhaps, more importantly, delivery systems must be designed which will draw upon the above models to make effective use of scarce educational resources. In the paragraphs below, we review some developments which, we believe, hold significant promise for a new orientation to the adult learner. Where possible, we provide examples to assist potential users in adapting these models to other educational settings.

THE KNOWLEDGE WORKER

In recent years, more attention has been paid to adult development and employment as it impacts learning. Schlossberg (1984) provides a synthesis of the views of major theorists in which she highlights the work of Erikson (1950); this provides a framework for looking at the recurring themes of adulthood. Erikson, Neugarten, Levinson, and others refute the belief that adulthood is a period of extended stability. Rather, each of these writers makes the point that adult life is a succession of periods of stability and change.

Adults adapt to various transitions in their lives and change interests, goals, and values as a result of life experiences. The early years of employment are labeled by Vaillant (1977) as years of career consolidation. During this time, adults translate their interests and ambitions into occupations. As the issues of career committment, satisfaction, and valuation of work are repeated over one's life span, individuals progress through recurring periods of stability and change.

It is important to recognize that the pattern of adult development referenced by the above writers is significantly changed by the work environment of the contemporary professional. The modern professional is characterized by his/her dependency upon knowledge. Professionals have, in effect, become knowledge workers; individuals whose central focus has to do with acquiring, organizing, and utilizing information in a variety of forms. (Ammentorp and James, 1984)

The emergence of the knowledge worker has been aided by several cost-related trends. For instance, labor costs have accelerated at an average of seven percent per year during the decade 1975-1985 while the costs of information technology have been declining. Communications costs have decreased at a ten percent annual rate, electronics at a rate of twenty percent, and computer memory at an impressive forty percent. (Fronk, 1982) Thus, the balance between personnel costs and technology costs has favored rapid development and utilization of information technology in the professions.

The professional knowledge worker is, consequently, one who is in much closer touch with the information baase of his/her field. As Figure I suggests, the practicing knowledge worker draws upon the foundations of his/her field in an ongoing dialogue. This Figure also shows how training plays an integrative role in professional uses of knowledge. Through training in information technologies, the practitioner acquires competencies in utilizing databases within his/her field and relating data elements to theoretical knowledge or expertise. At the same time, new field-specific technologies can be applied to problem solving in practice.

FIGURE I

KNOWLEDGE AND
THE PROFESSIONS

The dotted lines in Figure I point to a critical feature of the new, knowledge based, professions. The professional is now not only a user of knowledge and technology, but a developer who adds to the expertise of the field. This brings the focus of new knowledge generation closer to the practitioner and results in rapid development of new information and understanding.

TOWARD A SUBJECT MATTER MODEL

The dynamic relationship between the learner and the subject matter of the field has an important implication for higher education. In the past, subject matters have been relatively stable and, when changed, were almost totally under the control of the university. As the locus of control over subject matter moves in the direction of practice, the character of subject matter changes. We require, in effect, a new model of content to teach to the potential and needs of today's adult learner.

In Figure I we see that the conceptual foundations of the field index all aspects of professional expertise: technology, knowledge, and the working database. The distinction drawn in Figure I between concepts and knowledge is, of course, somewhat artificial. Concepts and knowledge are intimately linked and are the building blocks from which the working data of the field are constructed. It is these elements of subject matter which are most dynamic in the modern professions. In Figure II, we show how this knowledge base is under continual pressures for change from a variety of sources.

FIGURE II

KNOWLEDGE SYSTEMS

While all educators clearly recognize the impact of technology on knowledge, many fail to grasp the significance of other forces working to change subject matter. For example, the rapid growth of information technology is dependent upon scientific advances in data storage and communication, but the economics of information and its social significance are the driving forces for its explosive growth as a subject matter. Each of these forces must be continually monitored and subject matters adjusted according to technological, economic, and social change.

This means that the structure of knowledge presented to the adult learner is not a fixed body of information ready to be mastered. Instead, it is a fluid collection of rules, concepts and strategies which must be acquired by each learner. (Sridharan, 1982) In a sense, the learner is attempting to acquire an expert perspective on his/her field so that he/she might apply information to novel problems.

The key point here is that the integration of knowledge and experience is the essence of professional learning. To quote Meltzer, "...all our knowledge at the last arises from experience and can only be validated by experience. Furthermore, our modes of cognition stem from our experiences of the world ... (1985, p42). An experience-based model of subject matter requires active engagement between the knowledge base and the learner. Accordingly, delivery systems for the adult learner must have a configuration quite unlike the traditional educational system.

A NEW DELIVERY SYSTEM DESIGN

Since the knowledge base is continually changing - and the practitioner is playing a central role in developing new knowledge - it is essential that the adult learner acquire a structural perspective on the subject matter of his/her field. Learning must, in effect, be an ongoing dialog with experts concerning emerging concepts and rules for utilizing and applying knowledge. This can be facilitated in delivery systems which make use of computer technology to manage continuous conferences on topics of central importance to a particular field.

FIGURE III

DELIVERY SYSTEM
FOR TRAINING
KNOWLEDGE WORKERS

In this Figure we show a simple schematic of the relationships among the key elements of an instructional delivery system. The body of concepts and rules making up the subject matter of the field is stored in an abstracted form in a Database. This Database is linked to both Experts and Trainees through a Conference Interface. The Interface is a computer-controlled conference which is managed by the Expert. The conference is initiated by the Expert as he/she highlights critical concepts or issues in the subject matter. These become conference topics which can be read and commented upon by all participants.

In this system, knowledge evolves as all participants add their inputs to topics under discussion. The Trainee also benefits from the many perspectives of other participants and from the new knowledge which is generated as participants apply the results of the conference to professional activities. (Meeks, 1985)

The authors are presently associated with Saint Marys College (Minnesota) in a delivery system design project using the above approach. The conference experts in this application are researchers in learning disabilities who work with a small, national team of persons with similar interests. These persons make up the foundation of the conference and are responsible for the construction of the initial database.

Students at the College have access to the conference and can utilize research findings in their own work with learning disabled children. The results of these experiential tests are added to the conference database to provide guidance to researchers in applying medical models to learning problems.

This particular application is a primitive test of the concepts outlined in this paper. However, there are some preliminary conclusions which might be drawn by way of summary.

SUMMARY

* New Models Of The Learner Are Needed:

The results of research on the adult learner indicate that undergraduate models are insufficient guides to program design for the professional, adult student. Models which appear to hold some promise are those based on adult development and/or those which visulaize the adult learner as a knowledge worker.

* Dynamic Models Of Subject Matter Are Required:

The rapid changes in subject matter content and structure require models of knowledge which permit easy addition of new rules and concepts. At the same time, the subject matter model must accommodate the learner/knowledge worker as an active participant in generating and testing knowledge.

* Interactive Delivery Systems Are Indicated:

The importance of dialog in the above models is the key to design of effective delivery systems for knowledge worker training. These dialogs cannot be the structured interactions of traditional classrooms, but must provide for time and space flexibilities consistent with the role of the modern knowledge worker.

BIBLIOGRAPHY

Ammentorp,W. and James, S.; "Technology and the Intellectual Content of Graduate Programming"; Proceedings Third Annual Non-Traditional Educational Conference, George Mason University: Fairfax, Virginia, 1985.

Chaffin, P.; Adult Students In Post-Secondary Education; Unpublished Ph.D. Thesis, University of Minnesota, 1985

Cross. K.P.; Adults As Learners; Jossey Bass: San Francisco, Calif., 1981

Erikson, E.H.; Adulthood; Norton: New York, 1978

Fronk, R.L.; Cost Forces Affecting The Office; A.D.Little: Boston, 1982.

Hill, S., et.al.; Characteristics of Post-Secondary Studies; National Center for Educational Statistics; Report No.2 82-321, 1982.

Meeks. B.N.; "An Overview Of Conferencing Systems"; Byte, Vol 10, No. 13, 1985.

Meltzer, B.; "Knowledge and Experience In Artificial Intelligence"; A I Magazine, Vol. 6, No. 1, Spring, 1985.

Morstain, B., and Smart, J.; "Reasons For Participation in Adult Education Courses"; Adult Education, Vol. 24, 1974.

National Center For Education Statistics; Projections Of Education Statistics to 1986-87; Washington, D.C., 1978.

Schlossberg, N.; Counseling Adults In Transition; Springer: New York, 1984.

Sridharan, N.; "A Flexible Structure For Knowledge"; Proceedings, International Conference on Cybernetics and Society; Seattle, Washington, 1982.

Vaillant, G.; Adaptation To Life; Little, Brown, 1977.

FIGURE I

KNOWLEDGE AND THE PROFESSIONS

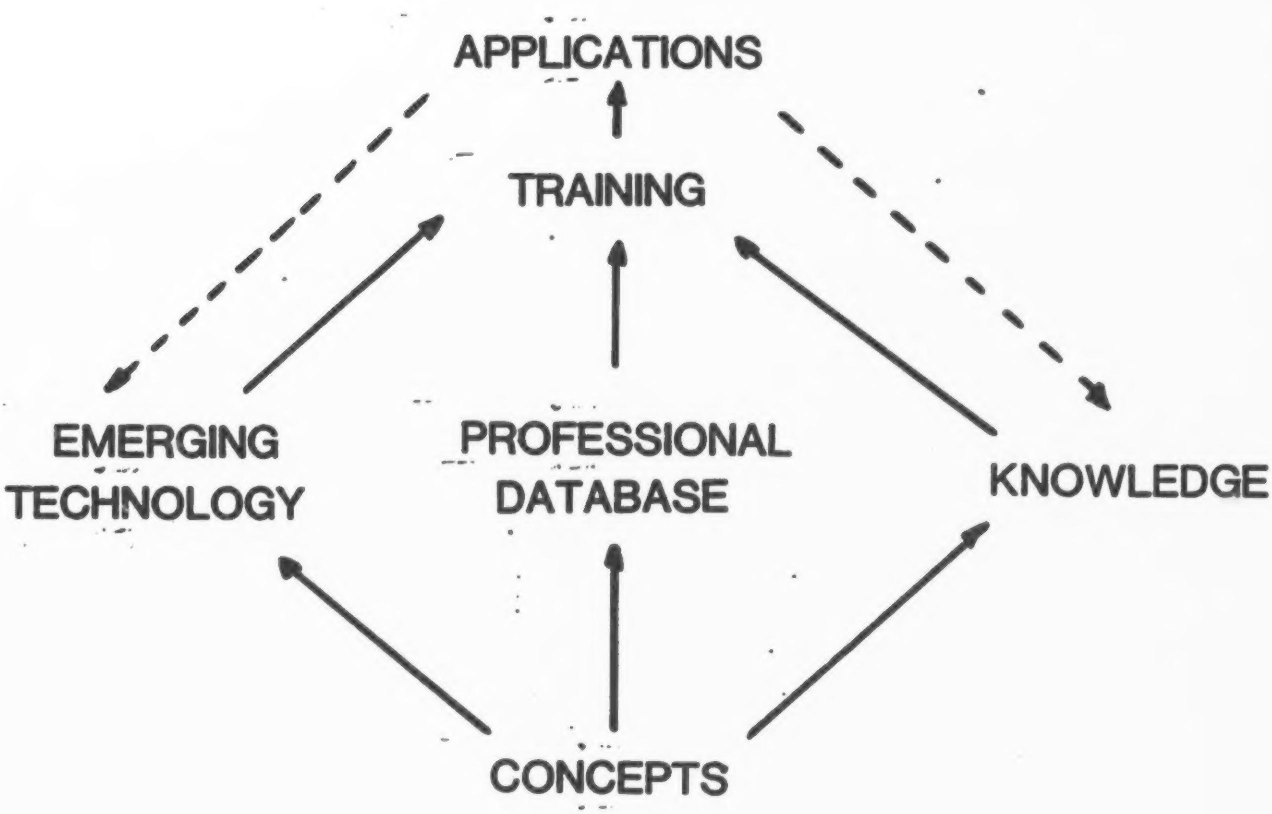

APPLICATIONS
TRAINING
EMERGING TECHNOLOGY
PROFESSIONAL DATABASE
KNOWLEDGE
CONCEPTS

FIGURE II

KNOWLEDGE SYSTEMS

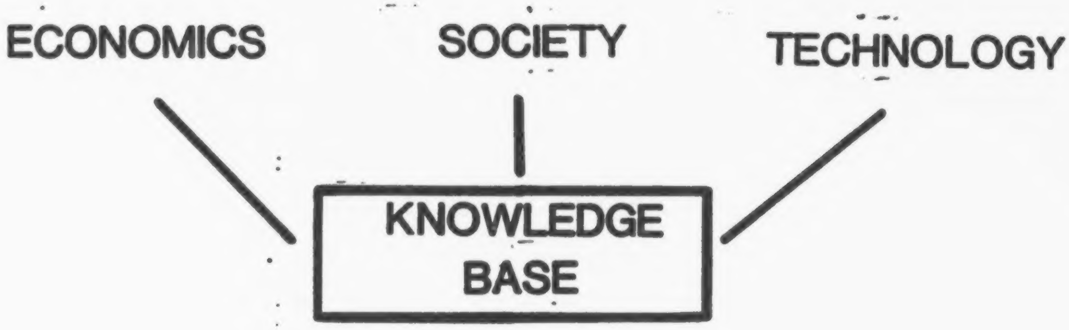
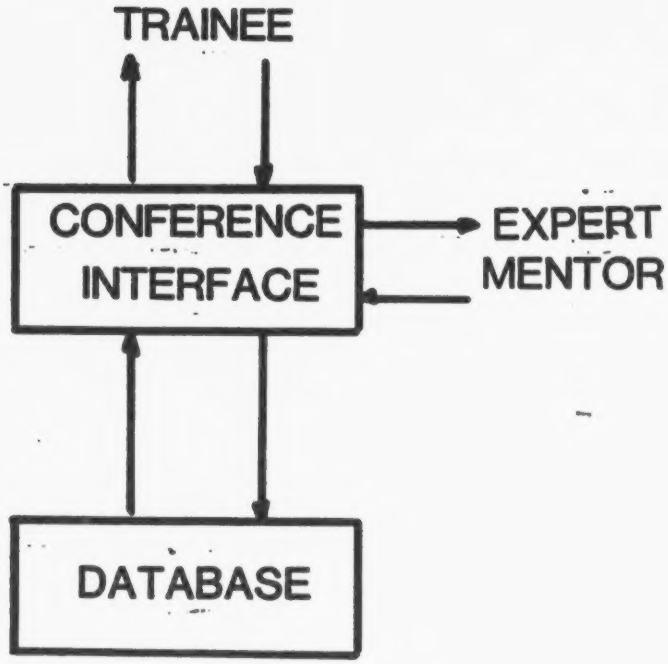

ECONOMICS
SOCIETY
TECHNOLOGY
KNOWLEDGE BASE

FIGURE III

DELIVERY SYSTEM FOR TRAINING KNOWLEDGE WORKERS


TRAINEE
CONFERENCE INTERFACE
EXPERT MENTOR
DATABASE

FUTURE REQUIREMENTS IN MANAGEMENT TRAINING--TEACHING AT THE UNIVERSITY LEVEL

by

Barbara G. Connellee

Los Alamos National Laboratory

FUTURE REQUIREMENTS IN MANAGEMENT TRAINING - TEACHING AT THE UNIVERSITY LEVEL

American industry is receiving its greatest challenge from the Far East. In particular, Japanese industry has risen from the ashes of World War II to become a leading industrial power. The United States is richer in natural resources and capital than Japan and could have tapped the same world supplies of cheap labor or taken steps to make the higher paid American labor force more efficient, but the Japanese outperformed the United States by adopting a management style which makes better use of resources and capital and which emphasizes achieving quality and productivity through people. Faced with the obstacle of a reputation for poor quality, the Japanese called upon two Americans, Dr. Edward Demming and Dr. J. M. Juran, to help them improve their quality. What evolved was quality circles. The quality circle recognizes the importance of accessing the creative power of every employee to solve work-related problems. United States industry has recognized the value of group problem-solving and is now making ever increasing use of quality circles. The implication of this trend is that there is a high probability that a graduate may be involved in this human resource activity and universities would do well to follow Harvard University's example and provide at least an introductory human resource course which would be appropriate for all graduates.

Development of a trend

Beginning in 1962, the employee-oriented quality circle movement grew until by 1979 there were more than 100,000 registered circles in Japan. Seeing the success of Japan, in 1974, a major U.S. firm started quality circles. After this first step, the movement toward more participative management has gained momentum so that by 1984 there were an estimated

15,000 companies in the United States with some form of circle activity, according to the International Association of Quality Circles.

The trend toward involving employees in problem-solving groups is a continuing one. This is because studies have shown that the more suggestions offered per employee, the higher the direct labor efficiency and the better the quality.[1] Gathering suggestions by groups tends to increase the number of suggestions and to improve the quality of the suggestions. As General Electric puts it, "None of us is as smart as all of us."

A number of surveys recently reported show that a growing number of major companies are significantly changing the way they manage to make their firms more competitive. According to a study by the conference board, almost all of the 100 companies studied, including 52 pace-setting companies, are aimed at increasing productivity and product quality by enabling workers to participate in managing their work. Creating problem-solving groups is part of a broad range of techniques being used to spur change.[2]

In another survey of 195 companies, it was found that 55% will be establishing and expanding their productivity improvement programs actively in the coming year. Among the 81 employers that commented on their plans for initiating productivity efforts, the greatest number (14 firms) indicated that they would establish quality circles or expand the number that are currently in operation within their organizations or that they would organize labor-management committees.[3]

American quality circles still seem to be modifying and adapting to better serve the business community, but they are observed to be the second most popular innovation in the trend to find alternatives to traditional ways of working. Since this process has been in use longer than five years, and is growing, it is not considered to be a fad, but rather, something which will make long lasting changes in ways of working.[4]

Applications in high technology industries

Many high tech industries have made use of problem-solving groups. For example, to ensure mission success and the safety of the astronauts beginning at the time of the Mercury missions, the Manned Flight Awareness (MFA) program was initiated. The program was designed to impress upon members of the National Aeronautics and Space Administration (NASA) and industry employees the importance of their work and to reward outstanding performance.

In the period between Apollo-Soyuz missions and the first shuttle mission, NFA began to promote its goals through various motivational activities, including quality circles and the NASA Launch Honoree Program.

In 1985 the NASA/Industry panel made a decision to honor those employees involved in quality circles by inviting them to be part of NASA's Launch Honoree program for the April launch at Kennedy Space Center (KSC), Florida. Thirty-one organizations nationwide which support the shuttle missions were invited to send circle honorees. Participating firms include Rocketdyne Division, Rockwell International, Inc.; Marshall Space Flight Center, Alabama; and Martin Marietta Aerospace, Michoud Division.[5]

In 1981, the Los Alamos Scientific Laboratory initiated a pilot program of quality circles which continues to add new circles and to adapt participative problem-solving techniques to achieve the goals of a research and development laboratory. Similar groups have been initiated at Sandia National Laboratories in Albuquerque and at the Lawrence Livermore National Laboratory.

The earlier work of human relations theorists such as Herzberg,[6] Likert,[7] Maslow,[8] and McGregor[9] is now bearing fruit. We see workers who like participating in problem solution by using basic statistics to collect the facts on which to base their suggestions. Group dynamics are helping people make better decisions, build a cooperative spirit, and improve communications. Job satisfaction is enlarged, work is made more enjoyable because people are made to feel that they are a part of the company, and their views and suggestions are being listened to and implemented.

Not only do we observe an improvement in employee performance, but recent studies by Shakar Zahra, Assistant Professor of Management at Old Dominion University, and the Institute of Social Research at the University of Michigan, have shown that quality circles give managers an excellent opportunity to exercise new skills and develop innovative management practices. Results of the Old Dominion study show that over 68% of managers active in quality circles felt that the experience was beneficial to their careers. Additionally, over 87% felt circles help to draw managers and employees closer together; 56% said it allowed them to exercise more of their management skills; 53% reported an increase in commitment to their work; 51% claimed an increase in job interest; 41% cited an increase in job satisfaction; and 45% reported increased interpersonal skills. This study was based on a survey of 96 supervisors who were leaders in, or worked in companies that actively used quality circles[10].

In a separate study at the Los Alamos National Laboratory (Connellee, 1984),[11] 92% of the participants in the pilot program in quality circles expressed approval of the process; 83.3% felt that taking part in circles made their job more enjoyable; 90.1% felt that they had gained new skills which helped them do a better job (such as better communications, listening to others ideas, and seeking consensus); 83.3% observed that the quality of work in their area had improved, as well as productivity; 61.5% believed that relationships with others in other departments had also improved due to better communications. Finally, 66.6% perceived that management was more supportive and implemented approved recommendations on time.

Higher education interest and participation in quality circles

Higher Education has taken an interest in quality circles as well. Representatives from 47 colleges participated in the 1985 annual conference of the International Association for Quality Circles. The University of Northern Kentucky includes the study of circles as part of their human resource curriculum, and Arizona State offers a full semester course devoted to quality circles. Major high tech employers in the Phoenix and Houston areas are actively engaged in using problem-solving groups.

Examples of skills gained through participative group-solving at Los Alamos National Laboratory

Direct Oxide Reduction group:

- Changing the perception of management style from Theory X to Theory Y.
- Setting a climate of mutual trust and better communication.
- Using basic statistics to examine production rates.
- Involving group members in decision making as to corrective action needed.
- Achieving an atmosphere of mutual respect among participants.
- Motivating the group to continue high production rate and cooperation for an extended time period (more than two years).

Nuclear Materials Accountability group:

- Using team building to establish a cooperative attitude.
- Using statistics to identify problems.
- Helping a new supervisor to recognize the need for establishing effective training and communication skills, and assisting the supervisor to learn those skills.
- Encouraging a spirit of helpfulness and observing steps taken to assist new employees acquire job skills.

High Explosives Machining group:

- Helping the group adapt to a different, more participative, management style.
- Developing openness and mutual trust.
- Using the creative talent of all participants to achieve goals.
- Using participative management to solve work problems.

Recommendation

Each year thousands of individuals graduate with an engineering or scientific degree and find employment in industry or in a research and development organization. These graduates will enter the workplace with technical knowledge, but often they have not been trained in psychology nor have they been given any management training. Yet, they may find that they are assigned to supervise people as well as to solve technical problems. Supervision of others requires human relations skills which could and, I believe, should be taught efficiently in the college setting. A short course in participative management which teaches the following skills would be most helpful:

- Establishing rapport and mutual trust
- Problem collection and selection

- Problem analysis
- Problem solution selection
- Trial implementation and tracking
- Communication of results to management
- Developing flexibility in applying human relations techniques.

Ideally, the course would be highly participative and, following guidelines such as those recommended in the training material of the International Association of Quality Circles, would give students entering the work world better preparation for changes in the working environment.

REFERENCES

1. Katz, Henry C., Thomas A. Kochan, Mark R. Weber, "Assessing the Effects of Industrial Relations Systems and Efforts to Improve the Quality of Working Life on Organizational Effectiveness," Massachusetts Institute of Technology Study, Academy of Management Journal, Vol. 28, No. 3, 1985, p. 509-526.

2. Study by Conference Board on "New Management," Management World, January, 1985, p. 4.

3. Personnel Policies Forum Survey No. 138, Bureau of National Affairs, Inc., Washington, D.C., 1984.

4. Study by Goodmeasures, Inc., for the American Management Association, Behavioral Science Newsletter, Book XIV, Vol. 21, 1985.

5. Waldman, Marsha, "The Manned Flight Awareness Program Honors Circle Participants," International Association of Quality Circles Circle Report, Vol. 4-6, 1985, p. 1.

6. Herzberg, F., "One More Time: How Do You Motivate Employees?", Harvard Business Review, 1968.

7. Likert, Rensis, The Human Organization: Its Management and Value, New York: McGraw-Hill, 1967.

8. Maslow, Albert, Motivation and Personality, Harper and Row, New York, 1954 (2nd ed., 1970).

9. McGregor, Douglas. The Professional Manager, McGraw-Hill, New York, 1979.

10. Zahra, Shaker A., Study "Quality Circles Effect on Quality of Managers," Supervisory Management, Vol. 29, No. 8, 1984, p. 27.

11. Connellee, Barbara G., "Quality Circles in a Research and Development Laboratory," Proceeedings of National Employee Ownership and Participation Conference for Educators, Guilford College, Greensboro, NC, October 11-14, 1984.

Barbara G. Connellee is an administrative staff member in the Material Science and Technology Division at the Los Alamos National Laboratory, Los Alamos, New Mexico. She received her masters in business administration from the University of New Mexico in 1981. She has been an active participant in quality circles since 1981 and was instrumental in forming the first circle in the Material Science and Technology Division at the Laboratory. She is a member of Los Alamos and New Mexico Women in Science, the American Society for Training and Development, and the International Association of Quality Circles. Partly in recognition of her work in quality circles, she received the 1983 Award for Working Women from the Council on Working Women, Region 8, U.S. Department of Labor. She also received a special award in 1985 from the New Mexico Council on Working Women.

REACHING FOR THE POTENTIAL, II:
IDENTIFYING AND REACHING TEACHER GOALS

by

Paul R. Dingman

Reaching for the Potential, II:
Identifying and Reaching Teacher Goals

An earlier paper, "Reaching for the Potential," recast the preceptor role from teaching to potentiating. It emphasized that concepts of the means of motivating students must change; that teacher goals must be permitted to expand; and that teacher role and power functions within the system require restructuring.

It noted that many, perhaps most, colleges and universitites labor under the misapprehension that the product of their effort should be instruction. In such systems, faculty is seen as the labor force and students as the consumers. These systems consider their major problems to be increasing the output of instruction, reducing unit cost of instruction while maintaining quality indices, finding student consumers and motivating them to make use of instruction. That paper detailed why, given the premise that the product is instruction, schools cannot achieve excellence.

Reviewing briefly, the appropriate product of an educational system is learning. Society at large is the ultimatye consumer of learning. Learning is produced by students. Students are the labor force. Students cannot be motivated to learn, but fortunately, motivation to learn is inherent in the make-up of the human. Our task as teachers is to permit students to learn.

We also provide whatever students may require as they undertake their task, such as access to existing knowledge, methods, techniques, etc. We are servants of the labor force which produces learning. (Fortunately, we are also allowed to be learners ourselves to whatever extent we choose.)

Our goals, our aspirations, for our work are intimately tied to the nature of humanhood. Of course, we humans have always tended to glorify our species, making much of the characteristics which distinguish us. But the glory of the species lies not in its present condition--not in the use of tools, not in the development of language, not in the ability for abstract thinking--but in the infinite potential for change.

That is the foundation for the inspiration to teach. Each generation of students has the potential to reach beyond the known. We are not satisfied to be able to lead students to think, to learn for themselves all that we know. Our true fulfillment lies in the success of our students in grasping what we have not grasped.

Fortunate teachers have had the experience of a student growing beyond their accomplishments. Some have had the sublime experience of a student growing beyond their dreams, their hopes.

Four steps will be important to us in seeking that fulfillment. They are:

I. Unbinding ourselves from the myths of negative reinforcement.

II. Applying the knowledge that motivation to learn is inherent in the human.

III. Freeing individuals to learn through providing the environmental requirements for psychological growth.

IV. Understanding the roles of requirement and expectation.

I. Perhaps the most difficult is the necessity to rid ourselves of the notion that negative reinforcement can be useful. From earliest times, some writers have expressed the idea that punishment can increase or speed learning. That idea clings tenaciously for two sets of reasons. First, when we are irritated, frustrated or angered by others, we feel impulses to hurt. When those we would hurt are younger, less able or less experienced--students, for example--the impulse to hurt is unacceptable to us. So we express it to ourselves as the need to punish for the other's own good.

In more sophisticated eductional jargon, we call it negative reinforcement, and feel self-righteous glee as we inflict "the natural consequences of failure to live up to the behavior contract." We rationalize it as not really punishment, but "delayed gratification," "limited stimulation" or "time out." We quote psychologists who claim to show that rats or others have learned something as a consequence of negative reinforcement.

At the college level, of course, we are above such primitive concerns. We just quietly use ridicule, overload with unnecessary work of little learning value, or reduce grades to discharge our pique. Whenever we hear "...for his own good..." or "...she will just have to learn..." we know that intense, though camouflaged, hostility is at work.

Second, the notion of negative reinforcement clings because we are easily confused by post hoc ergo propter hoc reasoning. We hear a parent's observation,

"The child was misbehaving. I hit him. He stopped doing the forbidden act. That proves punishment works."

or a teacher's claim,

"This student was not working to her capacity. I gave her a flunk at midterm, and she straightened up and began doing her work. That proves punishment works."

Both imagine that because behavior change temporally followed the punishment, it came about because of the punishment. That's about as sophisticated as imaging that, if rain occurs some time or another later than a dance, the dance caused the rain.

Both probably missed a more important observation. The parent in the one situation, and the teacher in the other, had probably reached a state of resolve, a conviction that change in behavior was necessary.

Virtually always the resolve, never the punishment, is a critical factor in bringing about the change.

Those writers who imagined negative reinforcement to be useful can be safely be ignored. Other writers, again from earliest times, have seen the futility of negative reinforcement, however labelled. Most recently, the most respected of behavior scientists, including B. F. Skinner, have noted its lack of utility.

Let's rid ourselves, once and for all, of these myths, and thereby free our energies to serve our students more effectively. As we do that we'll find more satisfactory ways of dealing with our irritations and our frustrations.

II. Motivation to learn, like motivation to work, is a part of the nature of humans. Learning, like work, can be defined as the application of one's personal resources--intellectual, emotional, physical--toward a productive goal. Together they constitute the human's most important source of pleasure. Short of the bare requirements of physical survival, the human will sacrifice all else before giving up this source of pleasure.

Some disclaimers are in order, or course. Not all learning or work is pleasureable, and certainly no given undertaking is pleasureable for all individuals. Nor does all pleasure come from learning or work. Certainly we have other important sources.

However, other things being equal, the more learning or work available, the more pleasure, and

The more difficult the learning or work, within the individual's capacity at the time, the more pleasure.

Given these aspects of human nature, then the work of permitting students to learn seems simple enough. In principle it is, but difficult in application. To begin with, most have been taught from earliest childhood not to learn. Curiosity, outside specified narrow limits, is a punishable offense in most homes and in all kindergartens, elementary schools and secondary schools. A variety of prohibitions against curiosity is invoked against one from cradle to and through work careers.

At times it is difficult to assure ourselves that we are really willing to have our juniors learn anything they may choose to learn. We must be able to convince ourselves, however, or the stifled motivation of our students cannot be freed to fuel learning.

Some claim that the dangers of permitting any and all learning are far too great for us or for society to risk. They point to the possibilities of one learning the means of breaking laws or moral codes without discovery, of a student triggering a world conflagration by building and detonating a nuclear device, of an able individual penetrating and thwarting the intended operation of a governmental agency or program, or of the secret intentions or secret foreign operations of our national government being discovered.

However, all of the imagined horrible consequences of unfettered learning have occurred. Many already have discovered the means of escaping criminal justice, students have already described the construction of nuclear devices, government programs have been crippled, and foreign powers already know the details of the operations our own students are forbidden to examine. In short, there is no acceptable rationale for other than complete permission to learn.

When we accept that, we can stop wasting energy on guiding students away from the areas considered to be unfruitful or unwise. We can stop being sure of the importance to others of what we happened to have learned. Rather than pride in our instructional skills, we will have pride in our service to those who would learn.

III. The higher the level of psychological maturity the individual can reach, the greater the capacity for learning. Can we as teachers assist students in their growth? Yes, very powerfully, but probably not in some of the ways typically suggested. For example, counseling or advising on personal problems has less to offer in this regard than commonly supposed. Because we so seldom can know the specific help most appropriate, we can best look to the general environmental requirements for psychological growth. These are pleasure and protection.

One can't grow or even survive without pleasure. That's quite obvious in earliest infancy when the key pleasures--food, physical comfort and warmth, rocking--are patently necessary to survival. At any stage of growth, however, the more pleasure available, the more rapid is growth, and the more pleasure available, the more complete is growth.

Of course,providing infantile pleasures for young adults doesn't do much for their growth. Pleasures need to be in keeping with the growth already attained. That means, in addition to the truly open opportunity for learning as previously noted, opportunity to use themselves to the fullest in important productive activities. Make-work won't do. These are, after all, very able people. We ought to be able to accept them into our adult community and to expect from them an adult level of participation.

(It is often thought that there can be too much pleasure, and that too much causes spoiling. The opposite is the case. Spoiling occurs in those who are systematically denied the pleasures appropriate for their growth level, though many spoiled individuals are indulged in ways appropriate at a much earlier age.)

Humans in their growth need protection from physical, social and psychological dangers. The physical are the simplest to deal with and need not concern us here. By social dangers is meant the possibility that one create such dislike in others as to be barred from the pleasure of their company. That, of course, can take various forms. Ordinarily, most have developed the internal protection needed during childhood and adolescence, and arrive at our doors not needing much help. For the few, however, it is important that we not abdicate responsibility for reassuring them that uncivilized behavior is not condoned. That reassurance from us can be critical, regardless of what administrations may or may not do.

By psychological dangers is meant concern, of which the individual is not aware, over control of fantasy or impulse life. It is felt as anxiety. It can be particularly threatening and disruptive in early adulthood. Protection, in the form of technical professional help, will avail for only a very small percentage of individuals. We can provide important assistance in building internal protection. By manner and action we can show that we will not permit harm to self and others. One important aspect of this is our calm, tactful and effective way of dealing with neuroticisms and other classroom problems before we have become irritated. To do that we need a constant running check on our internal annoyance level. That's a tough assignment, but it's worth it. We have then shown in action, "I won't let you hurt me, even inadvertently."

IV. We all want power--power to cause others to behave more as we would like. Since what we usually want is for people to behave like responsible adults, we have exercised power in aiding in their growth. With that growth they can most effectively use their heads, their hands and their emotions toward our mutual adult goals, including learning. However, we'd also like to influence more rapidly and more specifically.

We know we can't do it through direct force. Force is quite ineffective in achieving goals if the goals require action of others. One can't actually make anyone do anything. In order to use direct force, each goal has to be redefined in terms of stopping or preventing action. That's always tricky, and often impossible.

The most effective means of influencing others to do as we wish is through the power of expectation. One could say there's a Law of Expectation as inexorable as the Laws of Gravity. Of course, both kinds of laws have to be expressed in terms of "other things being equal." Other things being equal, a rock released from my hand will fall toward earth with increasing velocity until it strikes. But if my hand happens to be moving at 25,000 miles per hour when I release it, the rock will go into orbit.

The Law: Everything being equal, people behave as we expect them to behave. I believe that's widely recognized and that we don't need illustrations of the general rule.

Surprisingly though, the phenomenon is seldom exploited fully and systematically. Especially, attention to it seems neglected in educational circles. Even though each of us can come up with examples of expectation in action, we often don't think through how best to apply it in the next situation.

What makes expectation work? At least six factors can be identified:

1. Calm assessment of the situation without anger. Anger diminishes the ability to think clearly, to sense others' reactions accurately and to act effectively.

2. Clear statement of the expectation, if it's not already obvious, also means and methods, and choices of means and methods, as appropriate.

3. Avoiding any suggestion of a possibility of non-compliance, as, for example, "If you fail to comply, horrible consequences will ensue." (That contains a double whammy in the form of a threat. See also 6, below.)

4. Care taken not to disparage the necessary activity. For example, sometimes a teacher will develop such a hate for an activity, such as memorizing the prepositions which take the various cases, or whatever, that a communication gets across to students that to be required to do it

is demeaning.

5. Care taken not to disparage or chide the person to be influenced. To do so may result in feelings of shame, guilt or reactive anger, or all of them. Any of them reduces the person's effectiveness, and makes the desired action less, not more possible.

6. Care taken not to threaten. Introducing fear reduces effectiveness. When frightened, people can freeze and do nothing, or fritter about aimlessly. Intense fear is the most destructive force in life. It stops growth, impairs functioning and causes momentary or long term regression to a more primitive level of organization. In that case, the individual may not even be technically capable of complying with the desired action.

Returning for a moment to the first point, assessing, that's when one must decide how badly one wants to influence behavior in a particular situation, and in a particular direction. Just how much time and how much effort can be comfortably given to it? There's no point in beginning a piece of influence if time requirements would then cause irritation, anger or resentment. Then the plan would necessarily fail.

Time limits can work for us, of course. Others, including students, have their own time budgets, loose as they may be. When we are willing to give more time and effort to our expectation than they are to resisting it, success comes easily.

A good word for the sense of the importance of an issue and our willingness to give it time and effort is "resolve." A corollary of the Law of Expectation can be introduced, the Rule of Resolve. It is: Other things being equal, the greater our resolve, the more likely are others to behave as we expect.

Usually we don't have to make a big deal out of resolve. We have it, and others sense it. Often we're not particularly aware of the process, nor are they.

Sometimes resolve does get expressed dramatically, and the response to it is occasionally dramatic.

Suppose a student having a difficult time developing an idea is being interrupted by a bright, impatient classmate. Suppose the interruptions keep returning after brief compliance with my requests for abstaining. Suppose it's very important to me that the first student complete development of the idea, and finally I go into a cold rage, do a John Housman on the second student, cutting him to bits with ridicule and announcement of imminent failure of the course.

Sometimes that might be followed by immediate full compliance and improved compliance for some time after.

Let's not be deceived, though, that rage works. It doesn't. In a rage we are less efficient. We lose sight of our goals and impulsively use ineffective methods. Those we want to influence can become afraid and then carry out our expectations less effectively.

We tend to forget the majority of situations--those in which we felt and looked foolish being angry and accomplished nothing--and to remember the isolated few like this when compliance occurred. We remember and glorify it at faculty gatherings, the TGIF sherry hour, and so on, seldom recognizing why rage seemed to have a desireable result.

Anger sometimes seems to have a desired effect because it serves as a signal to us that we are very serious--ready to give time and effort, ready to cause ourselves grief, ready to risk completion of all else--totally serious about the matter at hand. In other words, resolved.

Once we're resolved, others sense it, feel it. They didn't need to see the rage, just the resolve.

THE NECESSITY OF TRAINING BEFORE EDUCATION: THE FINGERTIP EFFECT AND LEARNING AS RELATED TO TEACHING COMPUTER SKILLS TO FACULTY

by

Carlton W. Dukes

New Mexico State University

THE NECESSITY OF TRAINING BEFORE EDUCATION:

The Fingertip Effect and Learning

As Related to Teaching Computer Skills To Faculty

I. INTRODUCTION

While fingertip writing, dialing telephones and keying in of figures into calculators have reduced the problems associated with short-term human memory as well as increase the speed of communications, they have also shaped the way in which ideas are formulated. Now, computers have been attributed with certain characteristics which, through the feedback of interactive processing, can imbue the user with opportunities for even more powerful learning and thinking. Some educators expect that learning to use computers and developing even modest programming skills will lead to higher-order intellectual processes. Research at the Harvard Graduate School of Education's Project Zero examined the potential contributions of engaging in programming activities such as analyzing procedural demands, devising a program-like plan and the notion of a "bug"--a host of concepts inviting analogy and application to other procedural contexts (Perkins, 1985).

Word processing too can make substantial structural changes in text both feasible and rapid; data base management systems can potentially reinforce the concepts of classification and relationship, while actual programming is supposed to teach intellectual frameworks of structure, logic and error isolation.

But too often, the exposure to such programmatic content does NOT result in the desired intellectual acquisition. Project Zero suggests that both "high road" and "low road" learning transfer must occur--the mindful abstraction of principles combined with extensive, varied practice before the development of powerful learning can take place. However, the evaluation of programmatic success tends to be dichotomous in outcome (Adams, 1974) as successful or unsuccessful in terms of taking advantage of available opportunities.

Why opportunities do not get taken may be related to a model by Hubert Dreyfus (1973) of The University of California at Berkeley which describes the level at which the learner is positioned instead of overall success. In this model adaptation, a sequential hierarchy of five levels begins with the neophyte computer user and proceeds through the functional, competent, proficient and expert levels. The differentiating characteristic is the extent to which one is dominated by, uses or creates rules.

By relegating learner success to a binary "yes" or "no" condition, curricula intended to induce higher-order learning through computer usage may fail becaus it may not determine just where on a continuum the learner has actually progressed. In effect, this abandons the student who has made substantial, but as yet incomplete progress on all the tasks or the student who has not reached the "magic cutoff score". Too often the person, not the adequacy of the test of proficiency, is being called into question (Madaus, 1985).

II. Sequential acquisition of knowledge

This paper focuses on experience in teaching college-level faculty the principles and applications of computers for Computer-Based Instruction (CBI) within a workshop and classroom environment, as well as the implications of establishing an ongoing program which is based on sequential levels of knowledge acquisition. It utilizes the five hierarchical categories described by the Dreyfus model which, if used to evaluate the participants position on the hierarchy, could have made the workshops and classroom experiences more effective.

A. The neophyte in a fundamental learning state is characterized by being absolutely rule-bound. Tasks are discrete and discontinuous. In this level, I have observed the participants in a faculty Computer Based Instruction workshop with one finger on the page of an instruction manual, and typing in the designated instructions with another. Even prior to that step, in turning on the computer and monitor, and inserting the diskettes, any interruption or error results in "going back to Square One" and reinitiating the entire "bootup" sequence. I neither expected nor found a comprehension of the actual processes, but a B after A before C series of activities, with expressed high anxiety and error rate.

B. The Functional Operator, has rules memorized by respective functional tasks, knowing the sets of activities/commands needed to start the system, load in a text editor, generate the lesson code and run the lesson presentation module. At this stage, the operator takes for granted the physical activities of turning on and operating the system, and also begins to sense if a sequence is taking too long or a disk drive "doesn't sound right". How things work together becomes more important, with task grouping becoming apparent. The Functional Operator can be characterized by seeking and creating predictability of events. It is usually during crisis cimcumstances such as accidental file or power loss that the operator who can carry out defined functions becomes anxious.

C. The Competent Systems User has by now learned the rules and consults them only for unusual situations, e.g. inserting another file or embedding graphic illustration in the major text material. There is a consistency and regularity in tasks, such as the use of content-free questioning strategies templates created in advance allowing "blank" multiple-choice frames to be copied into the lesson, with all the branching logic and screen formatting already in place. The competent user views the machine and the software processes as a coherent system, with the emphasis on using them as logical tools to assemble the components of a learning system. At this stage, anxiety often is replaced by curiosity, with few disasters and increasing opportunities for task variability.

D. Proficient Systems Developers are capable of modifying the rules to suit their own purposes, changing the appearance of a screen dramatically through the use of colors or windowing text, animation and graphics. This may involve the use of systems features which are undocumented but are inherent in the software being utilized. Using nested logic resulted in the development of a 16-level menu using logic statements which were either not depicted in the authoring system documentation or which the documentation specifically stated as not being proper.

There is a hierarchy and priority among critical tasks, grouping them together in time or by function. For example, a series of lessons may be created by using a text editor, but not submitted for machine code generation until they are all edited. This not only saves "disk swapping" but allows for similar intellectual activities to occur in clusters.

The Proficient Developer relates various systems to each other, for example using a "screen capture" program to take the report formats from a spreadsheet program, declare it as a file and allow the authoring system software to address it rather than re-type the desired rows and columns as input. The use of a graphic system library permits insertion of attractive detail without having to create it anew for each lesson.

Mere curiosity about "what might happen if..." is replaced by the challenge of developing an intricate, multiple level menu system using simulations, using alternative input devices such as a "joystick" or touch screen.

E. The Expert Systems Creator is a logical outcome of ultimate skill and knowledge. Expert Systems Creators develop their own systems and sets of rules, deciding the nature of tasks and their sequences, and set up their own system structures. In one case, an expert on the faculty shared only the same physical space as did the others during the workshop, skipping over the materials on text editing and going straight ahead with coding a lesson. There was an occasional question regarding command syntax, and acting entirely independently of the rest of the group, this expert produced a unique adaptation of the graphic commands structure to produce computer lessons involving binary tree traversals programming within an authoring system to produce pseudocode dealing with recursive functions.

This individual had progressed through the first four levels in prior experience bases and compressed days of instruction on authoring systems into less than two hours.

III. Relationship to high/low road mechanisms

It might be helpful at this point to compare the "high road" and "low road" learners to the five acquisition levels. As was mentioned earlier, Project Zero indicates that both "high road" and "low road" learning transfer must occur, mindful abstraction of principles combined with extensive, varied practice before the development of powerful learning can take place. In this investigator's mind, the Neophyte learner and Functional user correspond to "Low Road" transfer, while the Competent user and Proficient developer correspond to "High Road" transfer.

Before one becomes competent and proficient in the development of any computer-based task or system (viewed here as primarily intellectual functions), it is necessary to lay the foundation of skill acquisition garnered through extensive and varied practice. There is no substitute for exposure to many hours of digital representations of intellectual concepts which are presented through electronic excitation of phosphor.

As for the last stage, this is a category by and of itself--expert creators of systems are relatively rare. There are only a few who create BASIC, FORTRAN, Apple computers, VisiCalcs and inexpensive inference engines. They create the ideas and their applications, they make their own rules and these ideas are so persuasive that others are convinced that they need these concepts.

IV. Training Before Education

The continuing thread throughout all of these stages of skill and knowledge acquisition is in one commonality: the extent to which rules dominate behavior, are utilized or are themselves created.

The equivalent of "low-road" transfer is the neophyte level and is limited totally by rules, while the functional user memorizes them in application clusters. Transfer at this level can be described as training. The equivalent of "high-road" transfer is the competent user who only occasionally consults the rules for unusual situations, as well as the proficient developer of systems who modifies the rules to suit the demands of the task. Transfer at this level can be described as education. The expert creates the rules and is a category beyond the scope of this paper.

If the dichtomous outcome of pass/fail, mastery or non-mastery of "low-road" skills acquisition is used as the measure of success or its lack, this fundamentalist approach will almost always determine that all the neophytes are failures. Even the best functional users will fail at being creative authors of computer-based instruction because they will only be able to follow the rules, however good they may be at doing just that. And unless ever-continuing exposure to development of CBI is facilitated, most faculty can be expected to stay at the first two stages. A major factor to take into consideration is the level of prior exprience and skills. Since the workshops explicitly were announced as requiring "no computer experience" almost all of the participants had just that level of exposure. Indeed, of the 60 faculty in the workshop series, only ONE out of each of the four CBI workshops has continued on to develop workable CBI programs.

If the continuum criterion is used then the learning and acquisition process is viewed as a hierarchy. Rather than state that the faculty who attended the workshops failed to produce a significant number of CBI lessons, it might be better to recognize that some persons have not progressed far enough to be productive, and that others will not progress beyond the first or second stage. They have not "failed" and while they may never progress beyond those first two stages, they may recognize there are a substantial number of tasks which require so much time to master that pre-existing priorities may never allow adequate time and opportunities to put into CBI format. Unless there is opportunity combined with time availability (and what faculty ever have enough time?) there is likely to be no substantial numbers of CBI programs developed. Even very skilled young programmers, without exception, disclosed enormous time on task. There were no overnight wonders (Perkins, 1985).

Thus, faculty who do not progress into the competent and proficient levels may be successful in that they would, at the Functional User level, still have to invest as much as 400 hours of development time to produce one day of Computer-Based Instruction (Martinetz, 1984) may choose to stay with impact writing on a typewriter. They may also recognize that the return on their investment of time to progress to the competent level where more efficient utilization of information processing skills may be used is minimal, given the time on task that would be inevitably required.

V. A COMPUTER KNOWLEDGE ACQUISITION PROGRAM FOR FACULTY

First, an organized curriculum must be established by which faculty are taught according to a sequential model of training through the neophyte level to that of functional user. A separate course should be implemented for competency leading to proficiency, using the models below.

Second, there must be an adequate delivery system. Faculty cannot be reasonably expected to use their own or departmental computers for student CBI sessions, necessarily meaning obtaining cooperation from the University Computer Center.

Third, there must be a microcomputer immediately available--right on the faculty person's desk. To have to arrange for a session or loan of a PC interrupts idea flow, and worse yet, having to pick up materials and spread them over another functions work area is stultifying to the development of CBI. It may take as much as 100 hours to develop an adequate lesson lasting only one hour from the student's perspective.

VI. Models

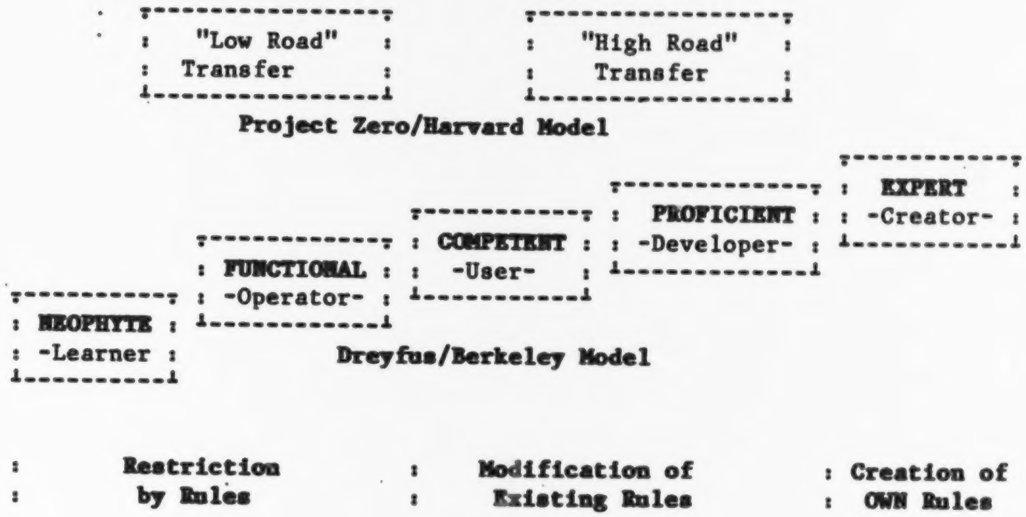

"Low Road" Transfer
"High Road" Transfer
Project Zero/Harvard Model
EXPERT -Creator-
PROFICIENT -Developer-
COMPETENT -User-
FUNCTIONAL -Operator-
NEOPHYTE -Learner
Dreyfus/Berkeley Model
Restriction by Rules
Modification of Existing Rules
Creation of OWN Rules

Figure 1. Learning Models for IPT

VII. A Program for Teaching Information Processing Technology to Faculty

Neophyte/Learner and Functional Operator Training

1. Machine fundamentals
   a. CPU/Screen
   b. Disk drive(s)
   c. Keyboard
   d. Printer

2. DOS processes
   a. Format and copy disks
   b. Load/save/copy/rename/ /delete files.
   c. Directories/(subs)

3. Word Processing
   a. Insert/delete/move text
   b. Bold/underscore/blink
   c. Center/indent/justify
   d. Heading/footing/paging

4. SpreadSheets
   a. Row/column referencing
   b. Formulas/functions

5. Electronic Filing
   a. Add/change/delete
   b. Index/sort
   c. Retrieve/list/report

6. Programming Computer-Based Instruction
   a. Program editor
   b. Machine lang. generation
   c. Lesson presentation
   d. Student record keeping
   e. Template usage
   f. Graphic components usage

Competent User and Proficient Developer Education

1. Document Management
   a. Outlining/indexing to classify concepts
   b. Screen editing to move text and ideas
   c. Dictionary/thesaurus vocabulary increase
   d. Simultaneous concept retrieval/display of multiple documents

2. Integrated SpreadSheets
   a. Information formats
   b. Formula interactions
   c. Orthogonal versus graphic reports

3. Data Base Management
   a. Classify and cross-classify data
   b. Hierarchies
   c. Relation structuring
   d. Search strategies

4. Programming Computer-Based Instruction
   a. analyze procedural / learning demands
   b. devise a program plan
   c. detect/debug concepts/procedures
   d. formulate questioning tactics
   e. develop teaching strategies

Figure 2. Information Processing Technology Program Outline

REFERENCES

Adams, E. N., 1974. On scoring a mastery learning control test. Journal of Computer-Based Instruction 1(2):50-58.

Dreyfus, Hubert, 1983. Telling what we know: the development of expert systems. Symposium on The Brain and The Mind, Johns Hopkins University. Audio tape NI-831207.02/02-C. 1983 National Public Radio, Washington, D. C.

Jacobson, Robert L., 1985. Microcomputer technology and knowledge of how people think are paving the way for a new era in testing. The Chronicle of Higher Education, XXXI(12):36-37.

Martinetz, Charles, 1984. A step by step approach to course development. Paper presented at a conference of the NSPI, Atlanta, GA.

Perkins, D. N., 1985. The fingertip effect: how information processing technology shapes thinking. Educational Researcher, 14(7), 11-17.

THE TEACHER/SCIENTIST: FROM TRAINER TO EDUCATOR

by

Michael J. Ellerbrock
East Texas State University

THE TEACHER/SCIENTIST: FROM TRAINER TO EDUCATOR

Michael J. Ellerbrock*

INTRODUCTION

In addition to the recent serious calls[1-7] for improved undergraduate education across all disciplines, several critiques[8,9] focussed on agriculture faculty in particular. Fundamental issues in both cases include: 1) the meaning of an "educated" person, 2) the appropriate model of the ideal university, 3) the training, development, values, role and evaluation of faculty members, and 4) the prospects and process for academic reform. This paper attempts to identify some of the current critical problems, address some of the key issues involved and propose a set of necessary, but probably insufficient, solutions.

PROBLEMS

Much of the literature on contemporary American education argues that universities are not producing well-rounded graduates, i.e. that schools are not educating the whole person in order to develop integrated, holistic citizens capable of effective personal and professional problem solving and leadership. According to Stephen Bailey, former vice president of the American Council on Education, "This nation is in woefully short supply of people equipped to look at problems as a whole, at life as whole. Without a sense of the whole, we have no way of evaluating the part. . . ."[10] Pirsig asserted that professors themselves are part of the problem:

> It's a problem of our time. The range of human knowledge today is so great that we're all specialists and the distance between specializations has become so great that anyone who seeks to wander freely among them almost has to forego closeness with the people around him. The lunchtime here-and-now stuff is a specialty too.[11]

---

* Associate Professor of Agricultural Economics and Chair, Faculty Development Committee, East Texas State University, Commerce, TX 75428.

The problem is not a recent development. In 1880, Dostoyevsky expressed his perspective on modern scholars: "But they have only analyzed the parts and overlooked the whole, and, indeed, their blindness is marvelous."[12] Today's emphasis on academic specialization has hindered development of the integrated person (student and faculty) and left many institutions struggling without a unified sense of purpose.[13-16] Tyler argues:

> The university has gone multi. And the 'community of scholars' has become a disunity of disciplines; it increasingly resembles Ardrey's noyau: 'groups of individuals held together by mutual animosity, who could not survive had they no friends to hate.'[17]

Furthermore, the solution to narrowness of intellectual vision and the limitations of specialization in technical fields is not for faculty to abandon research pursuits and work for schools with instructional missions only. Here, Pirsig believes:

> At a teaching college you teach and you teach and you teach with no time for research, no time for contemplation, no time for participation in outside affairs. Just teach and teach and teach until your mind grows dull and your creativity vanishes and you become an automaton saying the same dull things over and over to endless waves of innocent students who cannot understand why you are so dull, lose respect and fan this disrespect out into the community. The reason you teach and you teach and you teach is that this is a very clever way of running a college on the cheap while giving a false appearance of genuine education.[11]

Within agriculture, Conner calls for faculty to become more diversified in "knowledge and skills."[18] However, Conner's assessment ignores two key questions: 1) will increased knowledge bring increased wisdom and vision, and 2) will academic departments become more diversified by hiring more integrated individuals or by hiring a wider variety of technicians? Rassmussen and Hildreth feel the Land Grant University System has underinvested in agricultural research and call for more emphasis on "innovative" basic, versus applied, research,[19] yet their analysis avoids an important question: will faculty members be given the time to focus on quality and be creative on a few projects at a time, or will they continue to be pressured into producing an excessive quantity of manuscripts per year, an administrative expectation which partially explains professors' tendency to stress applied studies with quick turnaround time?

Another problem is that the curricular emphasis on specialization implies to the student that education is primarily a means to an end, i.e. a career, rather than an end in itself, i.e. to be an integrated, fulfilled person. Several authors have criticized this development[20,21] and several others have passionately espoused the latter viewpoint and discussed the definition of an "educated" person.[22-28] For example, Murchland argues that all students, particularly those in the sciences, must be taught that the technology they develop is not value-neutral.[29] Education should thus provide appreciation of the interrelationships of disciplines, e.g. engineering and ethics.

MULTIDISCIPLINARY ISSUES

Two examples of significant issues for students and faculty to address are: 1) the purpose of a liberal education versus the specialized needs of corporate employers, and 2) the relationship of science and religion. A substantial body of literature asserts that training in the humanities is of definite benefit to business managers,[30-37] though the argument is not without its skeptics.[38] Regardless of the degree of relationship between the liberal arts and industrial careers, the worst case scenario is for a student to infer from a university's disciplinary design and curricula that one must essentially choose between being an intellectual and having a lucrative career, yet many students feel confronted by such a dichotomy. Could this be partly attributable to the student's perception that his/her professor faced the same choice, and apparently decided to be either well-rounded (arts) or a specialist (sciences), but not both?

Concerning science and religion, are students aware that they might not be mutually exclusive? In the "Mysticism of Science," the noted paleontologist/theologian Teilhard de Chardin identified two basic commonalities between science and religion: "Rightly or wrongly, modern man has put his interest in an unbounded destiny beyond himself. And we have now all embarked to explore and conquer that future. Hope in a limitless future: the two essential characteristics of a religion."[39] With regard to the danger of exclusive reliance on rational thought, Gibran argued that passion should motivate reason and that reason should temper passion.[40] Palmer tried to reconcile Christian values with life as a scholarly faculty member who felt a ". . . contradiction between acceptance in respectable circles and the feeling of alienation and separation. . . ."[41]

Improving the quality of undergraduate education in the U.S. requires addressing the problems and issues presented here, plus others. An insufficient, but challenging, strategy is offered in conclusion.

SOLUTIONS

The alleged crisis in American academia forces a reexamination of faculty members' values and aspirations and of the goals and objectives of educational policy makers. Ten suggestions follow:

1. Faculty members should be simultaneously generalists and specialists.

Cleveland feels it is both possible and imperative:

> Breadth is not a contradiction of depth, but its complement. No one person can know enough to put a man on the moon, in the sense that grandpa could know just about everything about managing his corner grocery store. So different kinds of people, with differing knowledge and skills and networks of friends and acquaintances, have to come together in organizations designed to transmute their separate expertnesses and their collective insights into wise decisions about real-world problems--which are all interdisciplinary, interdepartmental, interprofessional and (increasingly) international. And the priceless ingredient is this: Each of the participants in this complex choreography has to have some understanding of the whole scene in order to play a relevant bit part in the big complexity.[42]

2. Writing should be a natural pursuit of a scholarly person, for in the words of Francis Bacon: "Reading maketh a man full, conference a ready man, and writing an exact man."[43]
3. As Haynes proposes, faculty development activities should support breadth in the professor and the curriculum:

> A professional development program designed to counteract the narrow specialization encouraged by professional training and career advancement must precede or accompany multidisciplinary curriculum, if the latter is to succeed.[44]

4. Policy makers must have the courage to reaffirm and support teaching as the foremost function of a university. Until then, Holmes holds policy makers responsible for the current problems.[45]
5. State colleges should find their niche in general education and/or a few strong disciplines, and not try to compete with the comprehensiveness or research orientation of large flagship institutions.[46,47]
6. Undergraduate programs, with emphasis on liberal and critical thinking, should be separate and distinct from graduate programs, with their emphasis on advancement of technical skills.[48]
7. Boulding argues that curricula should minimize technical skills and facts (training) and maximize integration (education) in promoting wisdom:

> We must reexamine the whole process of formal education from the point of view of what is the minimum knowledge, not the maximum, which must be transmitted if the whole structure is not to fall apart. Any economizing of learning, therefore, is highly desirable.[16]

8. University professors should lead by example in working together on complex, real-world problems. Botstein pleads:

> Who, if not the university, shall train the integrators? And what better way is there for the university to pull itself together than to try to pull the world together?
>
> Let there be a core course on Survival of the Species (SOS for short). Its object would be, first, to make each of us aware of our common peril. (If we can't get together out of

> love, perhaps we can huddle in fear.) Second, it would recommence the education of the whole man: the need for every learned man to know something about more and more, rather than more and more about something. Third, it could teach humility--the many knowns that are unknown; the many specific cures that cause unspecified ills; the difference between man, created in God's image, and God. Fourth, it could inspire regard for the "other"--the other discipline, the other tribe, the other self, the other world of the inarticulate and inanimate.[49]

9. Professors must be people of conviction,[50] even if it means losing merit pay for emphasizing quality rather than quantity in one's research contributions. A universal conviction must be to develop an intellectual philosophy. In 1922, Meiklejohn proferred:

> The essential fact is that we, the college teachers, have no philosophy. We have been trained within the elective system. We are the devotees of "subjects." We live and think amid the fragments of an intellectual world which has been broken down. Ours is the task of building up again another view of life to hold the meanings which we had and have. And if we shirk that task in study and in teaching, no unifying courses will repair the damage. If teachers think in fragments, they cannot teach in wholes.[51]

10. Lastly, professors must be spiritual people, in a nonsectarian sense.[52] Educators must realize that their every encounter with the student, particularly outside the classroom, communicates, at least subtly, whether the professor loves and supports the person as a developing human being, or regards the student as a client to be persevered. The spiritual professor uses knowledge to build people, rather than vice versa, and the student inevitably recognizes the difference.

REFERENCES

1. Bennet, W. J., "To Reclaim a Legacy." Chronicle of Higher Education. 29 (14), 1984, 16.

2. Association of American Colleges, "Integrity in the College Curriculum." Chronicle of Higher Education. 29(22), 1985, 12.

3. National Commission for Excellence in Teacher Education, "A Call for Change in Teacher Education." Chronicle of Higher Education. 30(1), 1985, 13.

4. Study Group on the Conditions of Excellence in American Higher Education, "Involvement in Learning: Realizing the Potential of American Higher Education." Chronicle of Higher Education. 29(9), 1984, 35.

5. Meyer, T. J., "Students Ask U. of Pennsylvania to Alter Curriculum." Chronicle of Higher Education. 30(11), 1985, 3.

6. Texas Members of the American Association of State Colleges and Universities, An Action Program for Excellence and Opportunity in Education: The Texas Dimension. Commerce: Office of the Pres. East Tx. St. Univ., 1984.

7. Goldberg, M. and J. Harvey, "A Nation at Risk: The Report of the National Commission on Excellence in Education." Phi Delta Kappan. 64(13), 1983, 14.

8. Douglas, G. K., ed., Cultivating Agricultural Literacy: Challenge for the Liberal Arts. Battle Creek: Kellogg Foundation, 1985.

9. Mawby, R. G., "Agriculture Colleges Must Take the Lead in Ending Ignorance About Farming." Chronicle of Higher Education. 28(11), 1984, 72.

10. Mawby, R. G., "Foreword," Cultivating Agricultural Literacy: Challenge for the Liberal Arts. (Battle Creek: Kellogg Foundation, G. K. Douglass, ed.), 1985, 7.

11. Pirsig, R. M., Zen and the Art of Motorcycle Maintenance. New York: Bantam Books, 1974, 121, 129.

12. Dostoyevsky, F., The Brothers Karamazov. New York: Random House, Inc. 1950, 202.

13. Billington, J., "Universities have Fallen Down on the Job of Teaching Values." U.S. News & World Report. 98(20), 1985, 69.

14. Bellah, R., "Individualism has been Allowed to Run Rampant." U.S. News & World Report. 98(20), 1985. 69.

15. Chambers, R. H., "Educating for Perspective - A Proposal." Change. 13(6), 1981, 45.

16. Boulding, K. E., The Image. Ann Arbor: The University of Michigan Press. 1969, 163.

17. Tyler, G., "Everybody's Core Curriculum." Change in Higher Education. 2(3), 1970, 51.

18. Conner, J. R., "Observations on Changes in Factors Influencing Agricultural Economics and some Implications for the Profession." Southern Journal of Agricultural Economics, 17(1), 1985, 1.

19. Rasmussen, W. D. and R. J. Hildreth, "The USDA-Land Grant University System in Transition." The Farm and Food System in Transition: Emerging Policy Issues. East Lansing: Mich. St. Univ. Coop. Ext. Ser., 1983, FS 16.

20. Rudolph, F., "The Power of Professors." Change. 16(3), 1984, 13.

21. Laney, J. T., "Education Should Be More Than Learning to Make a Buck." Dallas Morning News, 10-14-85, 18-19A.

22. Peterson, E. L., "Why Don't Students See Orion?" Agricultural Science Review, 5(4), 1967, 14.

23. Williams, D. A., D. Weathers, R. Dandza, M. Bruno and F. Maier, "Is College Worth It?" Newsweek. 105(17), 1985, 66.

24. Murchland, B. "Reviving the connected view." Commonweal. 106(2), 1979, 42.

25. GrosLouis, K. R. R., "General Education: Rethinking the Assumptions." Change. 13(6), 1981, 31.

26. Capra F., "The Turning Point: A New Vision of Reality." The Futurist. 16(6), 1982, 19.

27. Wirth, A. G., "The Philosophical Split." Relating Work and Education (D. W. Vermilye, ed.). San Francisco: Jossey-Bass, Inc., 1977, 12.

28. Crimmel, H. H., "The Myth of the Teacher-Scholar." Liberal Education. 70(3), 1984, 183.

29. Murchland, B., "Technology, Liberal Learning, and Civic Purpose." Liberal Education. 68(4), 1982, 297.

30. Hoffman, R., "Of What Use Are the Humanities?" Academe. 68(3), 1982, 25.

31. Stein, L., "The Worker and the Humanities." AFL-CIO American Federationist. 87(2), 1980, 22.

32. Day, C. R., Jr., "B. A. touted as the best for business." Industry Week. 223(2), 1984, 29.

33. Lear, R. and C. Groneman, "The Corporate Ph.D. - Humanities scholars bring new perspective to business problems." Management Review. 72(9), 1983, 32.

34. Ferguson, J. L., "Humanities and Careers in Business: Development of the Individual." Vital Speeches of the Day. 49(20), 1983, 617.

35. Smith, R. B., "Humanities and Business: The Twain Shall Meet - But How?" Vital Speeches of the Day. 50(20), 1984, 632.

36. Kenny, S. S., "Humanities and Business: Educational Reform for Corporate Success." Business and Society Review. 48, Winter 1984, 23.

37. Gutis, P. S., "Teaching Arts Instead of Accounting." The New York Times. 134(46,358), 1985, 17.

38. Cohen, J., "There Is Life After the Humanities." The Wall Street Journal. 205(15), 1985, 34.

39. de Chardin, P. T., "The Mysticism of Science," Human Energy. New York: Harcourt Brace Jovanovich, 1969, 164.

40. Gibran, K., The Prophet. New York: Alfred A. Knopf. 1982, 50.

41. Palmer, P. J., The Promise of Paradise. Notre Dame: Ave Maria Press. 1980, 12, 118.

42. Cleveland, H., "What Is 'Higher' About Higher Education?" Current Issues in Higher Education. Washington, D. C.: American Association for Higher Education, 1981, 1.

43. Northrup, C. S., ed., "Of Studies," The Essays of Francis Bacon. New York: Houghton Mifflin Co., 1980, 155.

44. Haynes, R. P., "The Humanities and Agriculture Program." Cultivating Agricultural Literacy: Challenge for the Liberal Arts. (Battle Creek: Kellogg Foundation, G. K. Douglass, Ed.), 1985, 126.

45. Holmes, I., "Devaluation of the Bachelor's Degree: the Blame Lies at the Top." Chronicle of Higher Education. 30(11), 1985, 42.

46. Weathersby, G. B., "Our Fading State Colleges: Have They Lost Their Vitality and Mission?" Change. 16(1), 1984, 18.

47. Cadwallader, M. L., "The Destruction of the College and the Collapse of General Education." Teachers College Record. 84(4), 1983, 909.

48. Murchland, B., "The Eclipse of the Liberal Arts." Change. 8(10), 1973, 22.

49. Botstein, L., "The Higher Learning." The Center Magazine. 11(2), 1978, 32.

50. Cadwallader, M. L., "A Manifesto: The Case for an Academic Counter-Revolution." Liberal Education. 68(4), 1982, 403.

51. Meiklejohn, A., "The Unity of the Curriculum." The New Republic. 32(412, Part 2), 1922, 2.

52. Schumacher, E. F., "Good Work." Relating Work and Education (D. W. Vermilye, ed.). San Francisco: Jossey-Bass, Inc., 1977, 55.

TRAINING OF GRADUATE TEACHING ASSISTANTS: A CASE STUDY

by

Celestino Fernandez

The University of Arizona

I. Introduction

In the ebb and flow of higher education, undergraduate education surfaces as a major issue every seven to ten years. During the last two years we have been riding a crest that has focused a great deal of attention on the structure and quality of undergraduate education. The debate has flourished at all levels, national, state and local. At the national level the discussion has focused on the three reports with which we are all familiar (see References). Many of us have met at regional and national conferences to criticize or offer our support for the contents of these reports. At the state level legislatures have become involved by enacting laws and regulations that directly or indirectly affect undergraduate education. At the local level, most colleges and universities have started discussions dealing with various issues central to undergraduate education. For example, a recent issue of Change Magazine (Nov./Dec., 1985) reported that 65.1 percent of Research I and 56.3 of Comprehensive I universities were reviewing their approach to general education.

Since at least the academic year 1984-85, most universities have been involved in a discussion of undergraduate education, whether through internal initiative or as a result of the national attention focused on this topic. At universities with graduate programs and in particular research universities, some of the attention on undergraduate education has necessarily focused on graduate teaching assistants. It has long been common practice that colleges and universities use teaching assistants as part of the instructional staff. Although it is quite common to use teaching assistants in basic language courses and entry level mathematics, teaching assistants have come to be used widely at universities, particularly in departments offering graduate degrees. Graduate students are frequently involved as part-time instructors, test graders, discussion leaders and laboratory session supervisors. In the past decade, an increasing proportion of teaching assistants have come from foreign countries; this is especially true in mathematics, physics, engineering, statistics and business.

Although there is some concern about the use of graduate students as instructors, the major issue centers around the preparation of graduate students for teaching responsibilities. The report on Integrity in the College Curriculum was rather critical of the failure of graduate programs to prepare students for teaching assignments. Following are some quotes from that report:

> "The emphasis of the graduate school years is almost exclusively on the development of substantive knowledge and research skills....
>
> During the long years of work toward the doctorate degree, the candidate is rarely, if ever, introduced to any of the ingredients that make up the art, the science, and the special responsibilities of teaching....
>
> Only in higher education is it generally assumed that teachers need no preparation, no supervision, no introduction to teaching....

> If teaching in American higher education is to become more effective and responsible, the awarding of the Ph.D. degree should also mean that the candidate has been evaluated as a teacher and not found wanting, and that the formal experience leading to the degree has included appropriate instruction in the responsibilities of the profession."

Most of us familiar with institutions of higher education would have to agree that, generally speaking, graduate programs have tended to do very little to prepare students to become teachers. Keeping this in mind, I turn to our study.

This paper reports on how one university is dealing with the issue of graduate teaching assistants. The paper is divided into five sections. This introductory section is followed by two short sections on procedures and results. The fourth section describes a plan of action, and the paper ends with a few observations that we might term conclusions.

Before proceeding any further, I would like to note that my own assessment of the state of affairs regarding undergraduate education is not as dismal as that implied by the three reports (to which I referred above) and the discussions resulting from these reports. Although the quality and structure of undergraduate education require some of our best attention at this time, it is not doomed to failure. On the contrary, I am most confident that the attention we are giving to this topic will result in some of the best programs the country has ever had for undergraduate students. In short, there is no reason to panic. Our deliberations should proceed in a normal fashion, making certain to include input from faculty and students. However, faculty and administrators must take the leadership role and be willing to act decisively. To be sure, little or no action by the universities will result in greater direct input from governing boards and state legislatures, and their actions, as you know, frequently have very little academic meaning since they are primarily based on political expediency.

II. Description of Study: Methodology and Procedures

In February 1985 the Dean of the Graduate College of the University of Arizona distributed a memorandum to Deans requesting information on programs in their college aimed at preparing students for teaching assignments. The Deans in turn requested similar information from department heads. With the exception of one college that does not employ graduate teaching assistants, the Deans of all colleges provided descriptions of training programs for graduate teaching assistants.

This study reports on an analysis of these materials as well as others related to the training of graduate teaching assistants at the University of Arizona. Included in the other documents, for example, are the following: A report submitted to the Arizona Board of Regents by the Arizona Students' Association in May 1985, a Policy on Graduate Teaching Assistants and Associates adopted by the Arizona Board of Regents at its October 1985 meeting, an Outline of a workshop offered by the Office of Instructional Research and Development for

Teaching Assistants and Faculty, and materials describing a workshop offered by the Center for English as a Second Language for Foreign Teaching Assistants.

III. Results

Contrary to popular perception, the overwhelming majority of academic units at the University of Arizona provide training programs for teaching assistants, albeit not necessarily in terms of a specific format. The variation in training programs, however, is almost as diverse as the disciplines represented at the University. Training extends from compulsory participation in workshops offered by the Office of Instructional Research and Development to training conducted entirely within the academic unit by individual faculty. In terms of time devoted to this activity, the span is anywhere from two hours to a full academic year that includes mandatory enrollment in a specific course designed for graduate teaching assistants in that academic unit.

The variation among departments also extends to other areas related to the use of graduate teaching assistants. For example, the quality of the training programs varies a great deal. A few departments that use teaching assistants do not have training programs at all, while others are quite substantive (in fact, one program is nationally recognized for its creativity). Also, there is much variation in the use of graduate teaching assistants. One department uses them as tutors, another as advisers, some as lab assistants, others as graders, discussion leaders and of course, many employ them as teachers.

Although one cannot find a consistent pattern for training graduate teaching assistants across all academic units, several of the programs include a requirement stipulating that before a student can be assigned to teaching responsibilities, he/she has to complete a course offered by the department that focuses on teaching the specific subject matter. For example, graduate students in the College of Nursing have to complete a course titled, "Teaching in Collegiate Schools of Nursing," and students in the Art Department have to complete a course titled, "Teaching Art in Higher Education." Incidentally, the discussion of training teaching assistants has prompted other departments at the University of Arizona to develop courses on the teaching of their discipline.

In terms of foreign students, most departments indicate that they "never" or "rarely" employ foreign students as teaching assistants, and in cases where they are used, they are seldom employed as teaching assistants during their first semester at the University. As might be expected, however, a large percentage of the teaching assistants in the College of Engineering are foreign students. In fact, fully 57 percent of the teaching assistants in this college are foreign students whose native language is not English. While the University has a policy that requires foreign students to take the Test of English as a Foreign Language (TOEFL), there is no University-wide systematic evaluation of spoken English. Yet the major concern of undergraduate students regarding foreign teaching assistants deals precisely with the oral language skills of non-native speakers of English. This is a common concern among undergraduates and their parents as evidenced, for example, by a recent article published in the Chronicle of Higher Education (Sept. 11, 1985) entitled "Colleges Try Tests and Training to Make Sure Foreign TA's Can Be

Understood."

Given this concern, I was interested in learning how departments assess the oral English language skills of students whose first language is not English. The most common and reportedly satisfactory method for assuring that foreign born teaching assistants are competent in English is the personal interview or conversation with a student. Obviously these personal "tests" are rather subjective and can result in the assignment of students who, at least from the perspective of undergraduates, have a great deal of difficulty communicating in the English language. None of the departments included in the survey use any of the tests available such as the Test of Spoken English (TSE) and the S-P-E-A-K Test to assess the level of oral language proficiency in English. Based on a review of materials from other universities, one can conclude that this is a rather common pattern. That is, few universities require that foreign students take a test that measures oral language proficiency in English as part of the admissions criteria, and most universities leave the assessment to the individual departments.

The most elaborate and successful training program at the University of Arizona is that which is conducted by Dr. Charles Davis in the English Department. All graduate teaching assistants, whether they have teaching experience or not, are required to take a departmental training program for a full academic year. The program includes enrollment in two courses which carry credit of one unit each. A course called Preceptorship focuses on methods and strategies in teaching composition. In addition to listening to formal lectures, students are able to discuss all aspects of the teaching experience such as grading, classroom management, preparation of lectures, etc. A course entitled Colloquium emphasizes theoretical and philosophical aspects of rhetoric and composition. Here too, students are able to focus on the teaching experience. The training program also includes a full week orientation in the fall and two full days in the spring prior to the beginning of classes. Each teaching assistant is assigned to a faculty member who acts as a supervisor. The supervisor works with the graduate teaching assistant throughout the semester and is involved in classroom visitations, both announced and unannounced, reviewing at least two sets of papers and in ongoing discussions with the teaching assistant under his/her supervision. Again, this program has been very successful at our University and others have used it as a model.

This section can be summarized as follows: Although most departments provide some type of training for graduate teaching assistants, except for a few cases, the training and supervision of graduate teaching assistants are uneven and undeveloped. The uneveness of the training programs should not concern us. Diverse kinds of appropriate training in different disciplines is quite appropriate. Training in First Aid is included for graduate teaching assistants in the Chemistry Department since they frequently serve as lab assistants, but First Aid is not relevant for teaching assistants, say, in the Social Sciences. I believe that we would agree that training for teaching assistants should be focused and directly relevant to the specific assignment and discipline.

The lack of fully developed training programs, however, needs some attention. The following section describes a plan that will soon be fully implemented at the University of Arizona in an effort to address this concern.

IV. Plan of Action

I begin this section by noting that the Arizona Board of Regents adopted a policy on graduate teaching assistants and associates at its October 1985 meeting. The policy includes three components designed to improve the selection, training and evaluation of graduate teaching assistants. The policy requires that the University of Arizona provide training in basic teaching methods and skills for all graduate teaching assistants; that regular faculty members assess the teaching performance of graduate teaching assistants, and; that foreign teaching assistants be tested for oral English proficiency.

Recognizing that employing graduate students as teaching assistants is a valuable feature of education at the University of Arizona since it is both educational for the graduate students themselves and it is a valuable component of undergraduate instruction, we are in the process of developing a full plan of action to deal with the issue of graduate teaching assistants. Although we are in the process of finalizing this plan, much of it has already been formulated and I can report on several of its features today.

A. The University will require that all students serving as graduate teaching assistants receive training prior to being assigned teaching responsibilities. Departments will have the alternative of providing the training themselves or requiring that students participate in a workshop offered by the Office of Instructional Research and

Development. Foreign teaching assistants will be required to participate in a workshop offered by the Center for English as a Second Language. This workshop will have five major components:

1. Improving overall comprehensibility.
2. Developing an awareness of cultural differences in education.
3. Providing cultural background information for the immediate environment.
4. Assessing remedial pedagogy.
5. Teaching effective pedagogic strategies.

It is our assessment that foreign students experience two different kinds of problems when they are employed as teaching assistants (Bailey, Pialorsi and Zukowski/Faust, 1984). The most obvious one, of course, has to do with proficiency in spoken English. The other which is less obvious but also very important has to do with cultural differences in education. Foreign students frequently come from systems which are very different from American higher education. Thus, in order for them to become effective teachers in our colleges and universities, they need to understand our educational culture, particularly as it relates to higher education.

B. We are developing a standardized form to be used by all departments that employ teaching assistants. This form will be used by faculty members to assess the teaching performance of each graduate teaching assistant. It is our expectation that there will be continuous feedback to the students throughout the semester so that they are able to improve their performance as necessary.

C. Foreign students whose native language is not English will be required to take the Test of Spoken English as part of their admissions to the University of Arizona. Students not scoring satisfactorily on the TSE (cut-off scores have not yet been identified) will not be permitted to serve as teaching assistants. They will be encouraged to enroll in the appropriate courses in the Center for English as a Second Language. Other follow up activities will also be available. For example, this fall we piloted a tutoring program for foreign teaching assistants and the Department of Communications offers a course for foreign teaching assistants that includes videotaping of presentations.

V. Conclusions

While there is wide use of teaching assistants in terms of disciplines and the types of activities that they perform, most departments require their teaching assistants to participate in some form of training. The quality of the training programs, however, is quite uneven. Universities in general, and the University of Arizona in particular, need to do a better job of preparing graduate students for teaching. We cannot continue to assume that university teachers do not need any preparation.

Training programs for graduate assistants will have beneficial short-term and long-term results. In the short-term we will be able to provide better instructors for our undergraduate students, and in the long-term we will be able to provide better faculty for colleges and universities since many graduate students select careers as professors.

It is quite obvious that the use of graduate students as teaching assistants will continue and that the percentage of foreign students will continue to increase in selected disciplines. The University of Arizona, I believe, will soon have a program that contributes to the development of graduate students as teachers. Upon completion of their graduate education, students should be in a position to bloom both as scholars and teachers.

References

Bailey, Kathleen M., Frank Pialorsi and Jean Zukowski/Faust (eds.)
1984 Foreign Teaching Assistants in U.S. Universities. Washington, D.C.: National Association for Foreign Student Affairs.

Bennett, William J.
1984 To Reclaim a Legacy: A Report on the Humanities in Higher Educaton. Washington, D.C.: National Endowment for the Humanities.

Project on Redefining the Meaning and Purpose of Baccalaureate Degrees
1975 Integrity in the College Curriculum: A Report to the Academic Community. Washington, D.C.: Association of American Colleges.

Study Group on the Conditions of Excellence in American Higher Education
1984 Involvement In Learning: Realizing the Potential of American Higher Education. Washington, D.C.: National Institute of Education.

THE VALUE OF A LIBERAL ARTS EDUCATION TO THE PROFESSIONALLY TRAINED

by

Charles H. Frost

New Mexico State University

The Value of a Liberal Arts Education to the Professionally Trained

by
Dr. Charles H. Frost

Questions concerning the appropriate level of, and foundation for, professional education in social work have been at issue throughout most of this century. In the early 1930's, after nearly a decade of hot debate, Social Work chose to follow the path of other professions in America and established education at the graduate level (MSW) as the major requirement for entry into the profession.(1) The American Association of Schools of Social Work ruled in 1937 that a two-year graduate program would be required of schools applying for accreditation after 1939.(2) This remained the primary criterion for professional entry in social work until 1975 when the Council on Social Work Education recognized and began accreditation of bachelor-level programs in social work (BSW). Earlier, in 1971, the National Association of Social Workers had begun admitting BSW's to membership.

Over the last decade, the number of accredited BSW programs in the United States has more than doubled; there were 151 in 1975 and 303 in 1981.(3) The number of graduate programs remained at approximately 87 during that period. Along with the growth of BSW programs, there has been an increase in the number of MSW programs that are "combined" or "joint," that is, which offer a BSW and MSW in five years (approximately half of MSW programs).(4) There has also been an increase in the number of programs offering "advanced standing" in MSW programs on the basis of undergraduate work in social work (approximately half of MSW programs) and in the number of part-time MSW programs and work-study MSW programs.(5)

There were, of course, a variety of social and economic factors in the 1960's and 1970's that spurred these changes in social work education.

These factors included an enormous demand for social services personnel, the civil rights movement, and a general increase in the demand for higher education.

Because of these developments, there has been a marked increase in the number of students entering graduate education with the BSW, many of whom then complete their education in less than the standard six years than had been the expectation in earlier days, or with fewer units of study than was once required. The effect of these changes in educational preparation for the profession merits evaluation. If the BSW degree, along with the various arrangements that accelerate the time required for completing the MSW that flow from it, serves the profession and the community well, it ought to be encouraged. However, these new arrangements ought not to be embraced merely because they prove to be efficient and econonmic means of producing BSW's and MSW's. The following long-run question must be answered: Are these arrangements effective? That is, do they result, at the least, in adding to the profession social workers who can demonstrate as high a level of professional acheivement as are produced by the more traditional pattern of a liberal arts undergraduate degree followed by two years of graduate education? If that is not the case, the profession stands in danger of fostering a system of education that will be less expensive and more efficient in the short run, but which will undermine the quality and further development of the profession in the long run.

It should be noted that the pre-professional vs. liberal arts debate in undergraduate education is not unique to social work education. There are similar disagreements among educators in other professions such as engineering, business administration and education. In an article in a recent issue of the Chronicle of Higher Education, for example, it is argued that liberal arts majors make superior professionals in business administration by comparison to graduates who had specialized too early, that the liberal arts are more likely to produce people "who have those intangible qualities of intelligence, imagination, curiosity, impulses, emotions, and ingenuity."(6)

A sufficient number of leaders in social work education, such as David Fanshel (7), Gilbert Geis(8), and others(9) have argued that a strong liberal arts education prior to graduate school is preferable to the BSW. This research is an effort to illuminate some aspects of this argument by comparing the "professional achievements" of MSW's who have had different types of undergraduate education.

Theory and Methodology

One of the assumptions in this research is that the singular characteristic that most distinguishes professionals from others is a capacity to think about, make judgments about, and integrate knowledge in their work. This characteristic is, of course, difficult to measure. However, it is demonstrated when professionals conceptualize and write about their work, and by the extent to which they communicate with and synthesize knowledge about practice and programs for others.

The characteristic to be measured -- "professional achievement" -- emerges over time and cannot be identified at the point of graduation from a degree program. Presenting and publishing papers, and holding office in a professional association, for example, are the kinds of professional activity that most MSW's do not engage in straight away after graduation. More likely these professional achievements will crystallize most emphatically in five or more years after completion of the MSW. Thus, the population studied -- MSW graduates of the classes of 1977 to 1981, who were out of school only for from one to five years, would be less likely to demonstrate professional achievements than their counterparts who had graduated before 1977. It is expected, therefore, that any differences found between BA's and BSW's in these cohorts of graduates would become even stronger over time.

The major hypothesis of the study is that MSW's with liberal arts undergraduate educations, i.e., BA's, are more likely to be high professional achievers than MSW's with Bachelors of Social Work (BSW) educations. This hypothesis is based on the second assumption in this research which is: Students are more likely to acquire from a liberal arts education the intellectual and scholarly preparation required for writing, communicating, synthesizing knowledge for, and conceptualizing about practice than from a BSW education.

The indicators used for professional achievement are as follows:

1. Is the Respondent (R) employed in the field of social work?
2. What is the Rs salary level?
3. Is the Rs primary professional work concerned with conceptualizing tasks or with practice tasks? (Conceptualizing tasks are those concerned with supervising, teaching, administering and planning programs, and research; practice tasks are concerned with providing counseling, casework, group work, and psychotherapeutic services to clients.)
4. Has the R achieved the California License (LCSW) for clinical social work practice?
5. Does the R hold office in a professional association?
6. Does the R participate in continuing education programs?
7. Does the R attend conferences?
8. Has the R presented a paper at a conference?
9. Has the R published a paper?

10. Has the R enrolled in an advanced degree program after completing the MSW?

In using these ten indicators of professional achievement, the expectation was that we would, for the most part, find small proportions of all Rs in the achieving group. However, we believe these small percentages of the professional population are significant because they represent the intellectual, political, and administrative leadership of the profession.

Questionnaires were sent to 2579 MSW graduates of the five years, 1977 through 1981, from the seven public universities in California that offer the MSW.(10) The questionnaire was sent from the school from which the R had graduated, with a cover letter from the dean of that school.

A total of 790 questionnaires were returned, 71 of which were not usable. Thus, we had usable responses from 719 Rs. Of these, 125 had BSW's (17.1%) and 594 (82.6%) had BA's.

Within the group of Rs, we find approximately the same proportions of men and women (28% and 72%) as in the graduating classes of the California schools and MSW graduates nationwide in 1977-81. The distribution of ethnic minorities is approximately the same among the group of Rs as among the MSW graduates of the California schools. And, as expected, the return rate decreases with each year since graduation. This occurs because, over time, the schools tend to lose contact with their alumni. Thus, our R group is heavily weighted toward recent graduates.

The questionnaire included questions that covered the 10 measures of professional achievement described above as well as descriptive information on year of graduation, age, sex, degrees, time elapsed between graduation and first job, and amount of full-time work experience prior to the MSW.

Findings

The study findings indicate that there are differences between BSWs and BAs in the direction hypothesized on all ten of the measures used to rate professional achievement. These findings are summarized in the following Table. As can be noted in this table, on all 10 measures of professional achievement the MSWs with BAs, as a group, out-perform the MSWs with BSWs.

Tables have been run to control for the following factors that might be expected to affect these associations: year of graduation; full-time experience prior to enrollment in the MSW; whether the degree was obtained

Table
COMPARISON OF PROFESSIONAL ACHIEVEMENT BETWEEN MSW/BA
GRADUATES AND MSW/BSW GRADUATES (percentages)

Factor	MSW/BA (n = 594)	MSW/BSW (n = 125)
Employment		
Full-time	82.9	76.0
Part-time	11.7	10.8
Unemployed	5.4	13.2
Salary		
$19,000+	60.1	48.0
Primary Professional Tasks		
Conceptual tasks	29.3	24.3
Practice tasks	70.7	75.7
Licensed Clinical Social Work	20.9	16.0
Office in Professional Associaton	7.2	6.4
Continuing Education	82.2	75.0
Conference Attendance	76.0	69.1
Conference Presentation	8.0	4.8
Publications	6.6	3.2
Enrollment in Advanced Degree Program	8.1	2.4

from the University of California or from the California State University; race; and gender. With some exceptions, we find that the relationships reported above do not change when these control variables are introduced. For example, minority Rs are more likely to have the BSW than a BA; but when the analysis is controlled for race, the differences between BAs and BSWs are about the same as for the whole population. Women are more likely to be unemployed than men, and they are more likely than men to attend conferences, to hold office in a professional association, and to enroll in an advanced degree program. Still, when the analysis is controlled for gender, the same differences emerge as reported for the whole population.

Discussion and Conclusion

The study indicates that MSWs with BA educations are considerably more likely to report professional achievements than those with BSW educations. Almost four times as many have enrolled in advanced degree programs, three times as many have published, almost two times as many have presented at conferences, and so forth. And, as indicated earlier, because we are dealing with MSWs who are out of school for only from one to five years, the data very likely underestimates the differences that would appear over the course of a full professional career. The findings support the contention that a liberal arts undergraduate education is superior to a professional undergraduate education for those who go on to do graduate work. The catch is, most social workers do not obtain a graduate degree. No one in the profession argues that a liberal arts undergraduate degree is superior to a professional undergraduate degree if you are going to be a social worker without graduate training. The BSW is better than the BA if that is going to be the end of your education. However, the study supports the value and the need for the study of the liberal arts for professionals. Therefore, every effort should be made to encourage professionals to take liberal arts courses. Unfortunately, there are frequent pressures in the opposite direction.

Professional schools tend to discourage students from taking liberal arts courses. When this behavior by proessional schools is admitted, it is usually "justified" in terms of the large volume of specific professional subject matter courses the student must already take. The contention is that not enough time is available for other courses. Regardless of the degree of validity of this position, the discouragement is also, to a degree, the result of "turf" protection. Professors need to maximize enrollment and so they maximize required courses within their department. It is clearly recognized by the leaders of every profession that various liberal arts courses are essential to the effective and ethical functioning of any professional. However, priorities direct "logic" and influence professions away from the liberal arts regardless of their value.

Numerous recommendations could be made to try and reduce or eliminate the pressures within professional schools that direct students away from the liberal arts. Accrediting organizations could, and sometimes do, exert a counter balancing pressure; degree requirements could be expanded and the length of time required for the degree increased accordingly; or programs could be encouraged to reduce the number of required courses. Despite any merit to these or other recommendations, their likelihood of enactment is close to nil due to various competitive forces both within and between universities.

What I would recommend is that the university create a required course for ALL entering Freshmen that helps them understand the values of liberal arts. This course would be team taught by faculty from ALL departments.

Professors from professional schools, the liberal arts, and the sciences would all participate and provide the entering student with an understanding of how these disciplines enrich one another. The focus would be on encouraging the student to value the liberal arts, to give consideration to extending his education so that it can be a fuller and more productive experience.

If educational leaders believe in the value of a liberal arts education, and historically they have so believed, then these values need to be communicated to entering Freshmen so that they can direct their studies wisely. Some will then extend their studies beyond four years, others will redirect their studies so that they incorporate more liberal arts courses, and some capable students who would have dropped out of school may discover a field of study they had not considered and retention of these students will be enhanced. If the course is well designed and rigorously taught, all students will see the themes common to all educational endeavor; will value Shakespeare's role in the life of the engineering student; will understand Picasso's contribution to social work; will move toward the ideal student, the student who is balanced, who sees all of life as a wonderous, vibrant gestalt; who perceives the need for life-long learning in subjects related to his profession and in the liberal arts.

NOTES

(1) This debate is documented in Leslie Leighninger, The Development of Social Development of Social Work as a Profession: 1930-1960, Doctoral Dissertation, School of Social Welfare, U. C., Berkeley, 1982, pp. 48-70.

(2) ibid., p. 207.

(3) Joseph Sheehan, Statistics on Social Work Education in the United States: 1975, p. 1, and Allen, Rubin, Statistics on Social Work Education in the United States: 1981, CSWE, p. 1.

(4) ibid., (Rubin) p. 3.

(5) ibid., p. 62

(6) Sam Bittner, "Liberal Arts Majors Prove Specialization Isn't Required for Success in Business," The Chronicle of Higher Education, April 14, 1982; Washington, D. C.

(7) As quoted in Miriam Dinerman, Social Work Curriculum at the Baccalaureate and Master's Levels, the Silberman Fund, N. Y., 1981, p. XV.

(8) Gilbert Geis, "Liberal Education and Social Welfare: Educational Choices and Their Consequences," Journal of Education for Social Work, Vol. I, No. 1, 1965, pp. 26-32.

(9) Maxine Greene, "The Humanities and Social Work Education," Journal of Education for Social Work, Vol. II, No.1, Spring, 1966, pp. 21-31; Gordon J. Aldridge and Earl J. McGrath, Liberal Education and Social Work, N. Y.: Teachers College Press, Columbia University, 1965; Boehm, W. Werner, Objectives of the Social Work Curriculum of the Future, N. Y.: Council on Social Work Eduction, 1959, Vol. 1; Paul Derrick, "Liberal Education and the Social Work Education" Journal of Education for Social Work, 14(1), 1978, pp. 31-38.

(10) The schools are: U.C. Berkeley; U.C.L.A.; and the California State Universities at Fresno, Sacramento, San Diego, San Francisco, and San Jose.

INTERNATIONAL BUSINESS COURSES--DEVELOPING A HANDS-ON EXPERIENCE

by

Terry L. Loveland and C. Lyn Abercrombie

Southwest Missouri State University

INTERNATIONAL BUSINESS COURSES--DEVELOPING A HANDS-ON EXPERIENCE

In the past few years multinational business firms have grown rapidly. Students entering business fields will encounter the effects of this internationalization. Global business transactions and company affiliations are now common, even among firms located in the central United States. In a study of international business, an acquired body of knowledge from text books and instructor experiences and research can be significantly enhanced through direct student contact with and seminars conducted by foreign business executives, tours of manufacturing and administrative facilities, and encounters with economic and cultural differences. No amount of written material can identify and convey these differences, nor discover similarities, as forcefully as firsthand contrasts of attitudes and environmental factors. An accredited foreign study program provides a unique and broadly based learning experience for the student--a "hands-on experience." The business practice component of the study program provides an opportunity to gain direct information relative to accounting, management, marketing, and financial practices in these countries.

Foreign study programs take two basic forms: foreign residency programs and foreign study tour programs. Foreign residency programs are centered on students' establishing residency in one location. Students attend classes at that location with occasional field trips to nearby museums and scenic areas. Foreign study tour programs cover a much broader geographical area with brief stays in several locations. Students have a variety of activities including visits to manufacturers, retailers, distributors, financial institutions, service companies, governmental organizations, museums, and scenic and historical areas.

Academic accreditation associations, professional business organizations, and multinational companies have recognized that students graduating from American colleges and universities have not been adequately prepared for the international business world. The American Assembly of Collegiate Schools of Business (AACSB) states that "the purpose of the curriculum shall be to provide for a broad education preparing the student for imaginative and responsible citizenship and leadership roles in business and society--domestic and worldwide--... every student should be exposed to the international dimension through one or more elements of the curriculum."(1) Well documented is the fact that one of the underlying causes of the imbalance in trade of American companies with their Japanese counterparts stems from a lack of understanding of their language, culture and business practices. American business students should be encouraged to study other cultures and languages. There is no better way to communicate this need than to provide study tours in which students come face-to-face with other cultures and personally feel the impact of linguistic difficulties. Students typically find this study tour to be one of the most informative courses in their college careers and feel the retention of information is much greater than that of on-campus courses. The ultimate advantage of a business foreign study tour over an on-campus international offering is the opportunity to view company administrative and manufacturing facilities, meet foreign personnel, and acquire a broader perspective of the foreign company operations and business attitudes within the parameters of the local culture, economy, geography, and political system.

A recent survey of 82 business schools indicated that 56 of the universities (68 percent) did not offer business study tours. However, 15 of the 56 (27 percent) plan to develop such a program within the next three years.(2) In response to this identified interest, the purpose of this paper is to provide course organizational information for faculty wishing to add similar innovations to their curricula and to identify some of the benefits gained by student participation. The authors were instrumental in guiding the early efforts to create this rather unique program at two universities and valuable experience was obtained through the organization and direction of four very successful study tours involving approximately 100 students.

OBJECTIVES OF A BUSINESS STUDY TOUR

According to a committee report of the American Association of State Colleges and Universities, "the startling acceleration of global interdependence and the obvious intersection of major domestic and international issues confronting the United States have deep implications for the curriculum, requiring that each institution of higher learning examine its international role and responsibility."(3) A business study tour will directly address that curriculum deficiency.

With the growth of world business transactions and the multinational company, it has become increasingly important for business students to learn about foreign customs, languages, cultures, economies, geographies, and factors affecting international business. The foreign business study tour responds to that need. Such business study tours have several potential objectives, including:

1) Study of foreign businesses that export products into the U. S.
2) Study of U. S. firms that have operations in foreign countries.

3) Study of foreign firms whose operations are solely in that geographical area.

4) Study of business firms and their response to political and cultural environments.

5) Study of the local cultures, cultural life styles, religious and life goals among the various nations visited.

6) Study of educational institutions, economic environments, and geographical influences.

7) Historical study of the area and points of interest visited.

8) Impact of conservatism on information disclosure of foreign firms as compared to U. S. firms.

9) View toward the harmonization of international business standards.

10) Student contacts with international firms (both foreign and U. S.) for possible employment opportunities.

It is difficult for a foreign business study tour program to focus on all of these objectives. Many of the objectives can be realistically attained if the program is well planned and executed.

An assimilation of this divergent information will create within the student a greater awareness of the world economic and business environment in which U.S. companies now operate. An international perspective is created and stimulated.

AUTHORS' APPROACH TO COURSE DEVELOPMENT

An accredited study tour must be academically sound, not a commercial sightseeing trip. The course proposal submitted for academic approval must logically support the necessity for the travel component and identify objectives. Time spent in study sessions and information gathering activities should equate with that of an on-campus course; pre-departure and post-return sessions plus structured sessions at companies and organizations and those conducted by the professors should approximate on-campus in-class hours.

Initial plans for the study tour are begun approximately 12 to 18 months prior to planned departure. Multicultural activities are planned and a diverse group of approximately ten companies and organizations are targeted for potential visits to provide a broad exposure to business information. Arranging for the visits may take on a multifaceted approach; direct contact by personal visit, mail or telephone; through U.S. parent firms or subsidiaries; embassies; foreign trade offices; or Chambers of Commerce. Contacts established frequently become useful in arranging future tours.

Since most foreign firms have little or no experience with this type of educational program, they must clearly understand the objectives of the course. During communication with the firm or organization, a suggested topical outline for the sessions is transmitted to provide some assurance of relevant information coverage. Firms occasionally suggest the use of a panel to allow various executives an opportunity to discuss their particular areas of expertise.

PUBLICITY

An initial offering of a study tour requires sufficient publicity via customary channels within the university; student newspapers, bulletin board notices, and announcements in appropriate classes. A brochure outlining course content, requirements, itinerary, and cost should be made available. Care should be taken not to "overpublicize" or "oversell" the course. Nonrefundable deposits should be required of students at the time of program enrollment to assure earnest intent. At this time, a flight bag, clip board, or similar memento with the study tour or university emblem should be given to the student; this item will serve to further publicize the course and give the student an immediate feeling of involvement.

ENROLLMENT AND COURSE REQUIREMENTS

Students enroll for three hours of summer credit in courses specifically designed for the study tour within the business departments. Each course requires the student to maintain a log of information gathered at the sessions along with daily comments about cultural contrasts and experiences. This log provides the basis for an in-depth summarization paper to be prepared after returning and submitted prior to the end of the summer semester. The paper is augmented by information contained in library reading assignments and supplemental handout material.

While students of all disciplines are eligible to take the course, business students derive the greatest benefit from the study sessions. The major of the student determines the proper course in which to enroll. Experience has shown that business students at the junior or senior level gain the most from the study tour.

PRE-DEPARTURE SESSIONS

Before departure, formal sessions are held on campus to provide students with business information about the countries and companies to be visited and course requirements. Library reading assignments are designed to further acquaint the student with the political, economical, and geographical characteristics of each country. A few key words and phrases are memorized of each major language to be encountered, which becomes essential in some of those unfortunate instances of becoming lost. Currencies of the countries are brought to class and students take part in exchange transactions. A past study tour participant or a native of one of the countries to be visited is asked to speak at one of the sessions. Students are provided a list of questions to help guide their participation in the sessions at the foreign companies. Additionally, each student is given a "unique" set of questions focusing on working conditions, housing, social programs, and related topics; answers to these questions come from an information "scavenger hunt" in which the student takes advantage of opportunities to obtain information from daily contacts with the local populace, whether through retail sales clerks, personnel at hotels, or elsewhere. The answers to these unique sets of questions are later shared with all participants so that all may benefit.

Students are provided a list of items to take along with packing suggestions. Students are informed of dress requirements for the business sessions and recommendations are made for daily clothing. Necessity for passports is communicated; passport applications and requirements are handed out.

Upon completion of the sessions, students have a general idea of what lies ahead. The sessions are particularly valuable for the student lacking prior international travel.

FORMAL SESSIONS AT COMPANIES AND ORGANIZATIONS

Prearranged sessions are scheduled at the companies and organizations to be visited and are taught by executives. The time allotted for the visits vary but typically last from three to four hours which generally allows for a tour of the facilities following completion of the formal session. In a classroom type environment, students receive information during the sessions about attitudes toward local and global business environments, management/ employee relationships, quality control, financial reporting and accounting regulations, capital generation, government control and influence, taxation, marketing policies, plus a host of other related types of information. Toward the end of each session topics generally tend toward local and regional working and living conditions. A question and answer period typically precedes termination of the meeting.

Depending on the size of the host firm and the facilities available, the group is sometimes broken down into smaller groups which permits separate sessions providing information tailored more specifically to the interests of the students. In these types of sessions, accounting officers typically speak to accounting students, marketing officers to marketing students, etc.

Intermittently during the study tour, professor-led meetings are held at the hotels or aboard the bus while traveling between locations which provides the opportunity to summarize previous business visits, contrast cultures and attitudes, and offer a forum for expression of student comments and opinions. These meetings offer the opportunity to provide guidance in the collection of information to be used later in student summarization papers.

POST-RETURN SESSIONS

After returning, review-reunion sessions are scheduled to summarize some of the more important findings of the study tour. Students are given the opportunity to share experiences and voice opinions about the favorable and unfavorable aspects of the study tour; student comments should be used as a tool in designing subsequent tours. Final guidance is provided for completion of the summarization paper.

Many students will also take advantage of this opportunity to exchange pictures, display photo albums, and generally share memorabilia. No doubt some lasting friendships are made; addresses and telephone numbers are jotted down. The session becomes important as a culminating experience.

SIGHTSEEING AND CULTURAL ACTIVITIES

All aspects of the study tour are educational, even the sightseeing, which identifies environmental influences. Typical tourist attractions have become popular generally because of cultural, historical, or geographical importance. These sights are not avoided, but rather can fill an important niche in the educational process. After all, business attitudes evolve from and are influenced by a combination of such factors as cultural and geographical influences. Since companies and organizations are open only during the week, weekends are devoted entirely to sightseeing.

BENEFITS TO THE PARTICIPANT

Students are frequently surprised to find that "people are just people," regardless of where they live; levels of economic development may vary substantially, but wants and wishes of the people remain basically the same.

Students frequently suggest that they have benefitted professionally, culturally, and personally. Professionally, they gained first-hand knowledge of prevalent accounting, financial, management, and marketing practices via contact with executives and through visiting their foreign operations. Culturally, students mention that communication is extremely important and they vocalize the importance of the being able to communicate in a foreign language. They also comment about their experiences with currency exchanges and their contact with nationals in their daily lives and working environment. Personally, students express the fact that they became a broader person because of the experiences of the study tour and that they made lasting friendships as a result of the study tour.

SUMMARY

Educating students to face the challenges of the international business environment remains in infancy. Colleges and Universities are responding to this challenge through an expanded international business curriculum along with emerging international business degrees. An ingredient missing in these campus courses is the study of non-U.S. business attitudes and practices as influenced by the environments within which foreign businesses operate. A business foreign study tour is a step in that direction; an opportunity is provided for the student to learn firsthand from foreign executives of their views toward global business issues. Given the nature of the program, student retention of information received is exceptional. The old Chinese proverb seems applicable:

> "Tell me, I forget,
> Show me, I remember,
> Involve me, I understand"

FOOTNOTES

(1) AACSB, Policies, Procedures, and Standards. St. Louis: American Assembly of Collegiate Schools of Business, 1985-86, p. 28.

(2) An unpublished survey conducted in December, 1985, by Professors Loveland, Abraham, and Bunn; all of Southwest Missouri State University.

(3) Internationalizing the Curriculum and the Campus. Washington, D.C.: American Association of State Colleges and Universities, 1981, p. 1.

ACTIVE LEARNING: THE EQUILIBRIUM BETWEEN STUDENT WRITING AND CRITICAL THINKING

by

Thomas L. Millard

Montclair State College

ACTIVE LEARNING: THE EQUILIBRIUM BETWEEN STUDENT WRITING AND CRITICAL THINKING

Thomas L. Millard
Montclair State College

If it is true that American society is in the process of transformation from an industrial to an informational society, then "excellence in education" (however it be defined) is more central to this change than ever before. With rare exception, educational institutions only achieve excellence when they are committed to excellence and use all possible means--persuasion, cajoling, insisting, or outright demanding--to achieve excellence in educational programs. Beyond doubt, the emerging demands of an informational society and those of students for market-centered skills are in this particular context more compatible than ever before. The changing nature of the work place and the demands for new skills and talent provide the opportunity to move beyond the rhetoric and reinvigorate our teaching efforts at performance levels appropriate to excellence in teaching demanded of a changing society and today's students. In the long run, nothing less than a redefinition of our commitment to teaching and a revision of expectations in learning outcomes will liberate us from public criticism of higher education. It is true, of course, no institution of higher learning has ever fully succeeded in achieving the high expectations a free society imposes on them. But only in a free society can institutions of higher education address themselves to these demanding tasks. In this context, no challenge is more important than the search for a new and fuller meaning to the idea of excellence in education. This task is all the more challenging because the answer will be found less in what we say than in what we do. It will be found partly on the scale of our achievements, but even more importantly, in the finished product.

This paper describes our program aimed toward giving concrete meaning to "excellence in teaching." We focused our efforts in nourishing student potentials in writing competency as market-centered skills.

Although writing is a necessary skill, whatever one's occupation, professional writing is not always a part of academic training; but with rising societal expectations and the increasing prominence of information processing as the new technology, there are signs that this position is changing. One important and influential sign is the findings and recommendations of the 1983 National Study on Education by the Carnegie Foundation for the Advancement of Teaching. Among other things, this report stated, "Writing is the most important and neglected skill in school," and went on to suggest that writing should be taught across the curriculum.

Genesis of the Project

This project began in 1975 as a response to the indistinguishable quality of graduate student term papers. We perceived the quality of student papers as unacceptable and symptomatic of a universal disdain for traditional term papers, and/or lack of appreciation of the importance of writing skills, in an environment that is highly dependent on print information and other forms of sophisticated communication. The purpose of this effort was the following: to enable students to perceive a higher value for writing proficiency by making writing of publishable quality a singular learning outcome, they could appreciate, as a measure of genuine individual accomplishment. The objective was simple and straightforward. We sought to develop individual capacities and to inspire creative thinking, while at the same time widening and deepening realization of these potentials. In order to mount the project, we had to find a rationale and method or mode of access to the untapped resources, and imagination of students, enabling them to fulfill their promise as students and future contributors to society.

Focusing on the inextricable connection between the real world and academe, we rationalize that writing skills could be developed if we linked such efforts to the idea that, 1) contributing to the extant literature from which one has received his/her academic training is a professional obligation and responsibility, and 2) that since every academically trained person should at some point in their career have something important to say about their work experience, cultivation of this attitude and development of skills in effective writing should be a teaching goal in graduate school.

Lack of Writing Proficiency Harms the Discipline

Any individual preparing for a vocation or career, be it industry, business, government or the professions, needs to understand that contributing to the existing knowledge base is a powerful stimulant for advancing knowledge for either basic or applied goals. No discipline can hope to retain its credibility if material for its relevancy and growth is absent. If students are poorly prepared for the writing that will be required of them, they will be sorely handicapped in discharging their indebtedness and obligation to their discipline. They will have failed (or is it the professor who has failed) to develop the importance of writing. And as prospective members of a profession with a stake in and a responsibility to question, challenge or add to the already discovered body of knowledge, they will be ill-prepared to be effective communicators. And because of our conviction that every professional person should at some juncture in time have something of importance, evolving out of their field of practice to share with their colleagues, development of the mental processes for effective writing is one of the most important measurable outcomes of professional training.

Publication an Option

The program was successful, in part, because it was made clear to the students that writing papers for publication was an option. We frankly acknowledged with no disrespect to the class the realization that probably most of them lacked the requisite skills for publication. We insisted, however, they were capable of writing good, short and simple declarative sentences expressing an idea. And it was this potential that was to be exploited with creative and imaginative thinking. Originality was stressed as a demonstration of the individual's capacity to think through ideas and conceptualize them in a meaningful frame of reference. In orienting the students to the assignment, they were cautioned, serious writing is always preceded by a search of the extant literature to discover if what one has to say is truly a contribution to the literature. Since the object of written work is to inform, we stress students should know what others before them have said about the same subject. To ignore past contributions, we admonished, is to impair the scholarship of their efforts. Lesson-wise, the students were apprised of the following: when a person says, "I know what I mean, but can't express it," the individual most likely does not know what he/she means. The individual still has some thinking to do. As the individual begins to pull his/her thoughts together, especially by learning to write in short, simple declarative sentences, the person will clarify his/her own ideas and, for some individuals, this is an excellent method for developing understanding of subject organization.

We made clear in the orientation, which was usually the initial class meeting, our strong belief that the development of attitudes and understanding of the importance of writing proficiency cannot be left to chance. We further believed that in future employment, their written work will be judged primarily on its contents; that is, on the value or quality of the information and ideas it expresses; that careful organization and clear, concise expression of content would be essential if the intended reader is to grasp the full meaning. Thus, the mental processes on which written expressions of ideas depend were reviewed. These included: 1) Generalizations: pulling together the common elements that relate specific examples, ideas or instances to one another; 2) Inferences: extracting the meanings that are implied but not stated explicitly; reading between the lines; 3) Analysis: examining parts of the whole, such as causes, effects and processes; 4) Synthesis: developing ideas into new relationships or contexts: creating, organizing the parts as in a puzzle; 5) Evaluation: making judgments according to a criterion: is it concise, readable, organized.

Our message to students emphasized that to be marketable and successful in today's world, they will need to experience, if only from a market-centered perspective, the rigors of critical thinking. This means: 1) developing the capacity to apply to new context the knowledge gained from classroom learning, readings, life experiences and library research; 2) developing the ability to draw conclusions, as opposed to simply restating or summarizing the works of others; 3) being able to state a thesis clearly and support same with reasoning and evidence; 4) being able to organize the parts of a paper in an orderly sequence, governed by a controlling purpose that is clear to the writer, with paragraphs and subsections containing their own internal organization; and 5) being able to adapt what one writes to the needs and expectations of the intended audience, whether it is one's peers, other scholars in one's discipline, or the general public.

Overcoming Student Resistance

At the outset, we recognized students will have various needs and abilities regarding this assignment: 1) those students who have the ability to write competently but who might need encouragement to write for publication; 2) those students who lack the intrinsic drive and self-confidence and might therefore require some market-force persuasion, reassurance and ego support; and 3) those students who for a variety of reasons would opt for the traditional term paper requirement. We were convinced, therefore, that students would need to be inspired, challenged or nudged into writing a mature and publishable paper with all the confidence that makes it possible. As an aside, I would point out that published papers as learning outcomes are significant indices of teaching effectiveness.

With respect to students' probable reaction, we anticipated initial resistance if not outright dismissal of the challenge to compose articles for professional journals. Our strategy in minimizing or disarming their arguments took the following approach, which proved to be effective.

1. Students were initially oriented on their soon-to-be professional status with all the "rights, privileges and immunities thereunto appertaining," including the obligation in contributing to the literature of their respective discipline. It was made clear that this is a responsibility all members of a profession assume: that only as the existing body of knowledge undergoes constant review and revision, as new ideas and experience emerge from practice, can the discipline maintain its usefulness and relevancy to the work place.

2. The advantages and benefits of serious writing were discussed in great detail. We noted, for example, the immense pride in seeing one's paper published in important journals alongside those of well-known scholars; the prestige and status accruing therefrom; its value factor in enhancing one's resume; the demonstration of one's ability to pursue doctoral studies. (Several of my writer-students have gone on to earn doctorates.) Lastly, we

stressed the equally serious commitment to writing as a significant measure or component of professional leadership. Publication of one's views, we observed, demonstrates ability to articulate issues, which is an important index of leadership.

3. For the timid, unsure student, our strategy involved encouraging them to "test the waters" by writing an "op-ed" piece, a short newspaper article or letter to the editor of their local newspaper or to a news journal (e.g., Time, Newsweek, U.S. News and World Report) in response to a news article. This approach had a two-fold purpose: 1) as a result of their "article," the student should feel more self-confidence, more comfortable with the ensuing demands of a larger, more substantive paper, and the rigors of serious writing; and 2) the student would be encouraged to use the published statement as the basis for a more fully developed paper with the usual references, footnotes and bibliography. It should be noted, several students have found this prescription helpful as a starter, perhaps, because it enabled them to sharpen their understanding of short, concise articles that communicate ideas. As a tool it was most effective.

4. Since lectures are the predominant method of instruction, and it is generally recognized that the educational yield from lectures is generally low, we sought to increase the yield by granting students a wide latitude in topic selection, including topics indirectly related to course content. Factors such as students' age, maturity, years of experience, discipline (my students represent a variety of fields, e.g., teaching, health professions, business and social welfare) and topic interest had to be considered, given the heterogeneous makeup of the class and the unusual requirements imposed on them. In general, we sought to strike a dynamically important note of inquisitiveness by calling to students' attention (especially those with years of professional

experience) the yet unsolved problems and issues in their field and encouraging them to re-examine the fundamental tenets of his/her discipline.

In this connection, the clinical value of this approach was that it made more palpable our assertion that as professionals already toiling in the "vineyards," there is much to be harvested in conceptual and theoretical questions culled from "hands-on" experiences. This strategy also helped in the breakdown of powerful anxieties and/or frozen attitudes. More importantly, it helped to persuade those students wavering in their choice between a term paper or a more substantial paper for publication. As a further inducement and source of support, we established a working relationship with the college writing workshop, a remedial program sponsored by the English Department for assisting students with writing problems.

Essay-Type Articles Stressed

The students were instructed to write essays and not research-focused papers, the requirements of which we considered too time-consuming and perhaps outside the individual's level of experience. They were advised to examine the college library's holding of journals and periodicals and select a journal they felt comfortable with for submission of their manuscript. They were further instructed to comply with journal's editorial requirement and not to follow the traditional term paper organization and style. We discussed protocol for submitting manuscripts, and the writer using his experience as a consulting editor to a journal, the juried/review process was explained as was the appropriate information for the cover letter. The students were also forewarned of possible rejection and the psychological let-down ensuing therefrom. But we assured the class that the best of authors have experienced editorial rejection, and the writer candidly shared with them his personal experiences with failure. At the same time, we reminded the students that a rejection was not per se a failure but an object lesson in writing, since it is a common practice for the editor to offer some instructive comments or reasons for the rejection. In some instances, we reminded the class, rewriting the paper with the editor's comments or suggestions in mind, and resubmitting it can often result in its acceptance.

Finally, the class was assured their paper would be graded on the same basis as a term paper. This statement was important lest those students opting for the traditional term paper perceive themselves in a disadvantaged position at grade time.

As an aside, whenever a student sought independent study, we found this an excellent opportunity to tout serious writing. While the student was allowed to fashion his/her own course of study, invariably we would convince the student that a paper of publishable quality should be one outcome of independent study.

Conclusion and Summary

The effort to improve the writing skills of students was in large part a function of the permissiveness of the assignment and teacher-student relationship. Perhaps, it is fair to observe, given the usual anxieties associated with term papers, in this instance, the student had the opportunity for choice-making and settled for the option (or anxiety) perceived as less menacing over the other anxiety which was seen as more threatening.

The resulting choice of the students has clearly the character of professionalism as the evidential material suggests. Student papers have been published in local, regional, and national publications including Adult Leadership, Journal of International Association of Pupil Personnel Worker, Today's Education, The Clearing House, Counseling and Values, The Guidance Clinic, Cimmaron Review, The Independent School Bulletin, Adult Education, Teacher

Paper, School Board Notes, School Leader, NJEA Review, Journal of Business, NAD Broadcaster, Childhood Education, Secaucus Home News, EAP Digest and Journal of Health Education.

It should be apparent, from the above, the correctness of the decision to permit a wide latitude in subject choice. Finally, we would reiterate, writing for publication was clearly an option. While there was initial resistance student evaluations at semester's end indicated a worthwhile experience. One other unanticipated but welcome outcome was students' new-found respect for published articles. Not only had these students learned to write proficiently, and in the process raised their self-confidence, but they also learned that to write is learning to think. And, perhaps, the most striking instance of success in this program was the affirmation of students to continue writing for publication in other courses in lieu of term papers. This was true even for those students whose papers were not accepted for publication. This unique teaching approach has the potential for a new model in student learning outcomes. As the results demonstrate, student publications, as a measure of cognitive learning experiences, are an attractive alternative to the traditional term paper. One further thought needs to be shared. Obviously, a number of factors, known and unknown, contributed to the success of the program. One factor that stands out is the following: Students find credibility in the writer's efforts, when they know that he has published. As a strategy, I would distribute copies of my articles as well as those published by former students. Each year, I would try to publish one or two articles so that my efforts would represent for students a model, a standard of sorts for much needed encouragement and support. Thus students recognized I would not demand from them what I am not prepared to demand of myself. I am certain this has been an important factor in my success to date.

PROFESSIONALIZATION OF TEACHER PREPARATION

by

Wayne Moellenberg
University of New Mexico

The task of describing methods and models of teacher education that will lead to better teacher performance is a fascinating one. On the one hand, its very complexity means that it has components which lend themselves to various preconceived notions, thus encouraging a wide variety of critics to have their turns at diagnosing the sources of ills in education and prescribing remedies. On the other hand, the same complexity leads thoughtful analysts to the obvious conclusion that simplistic remedies will fail and that available solutions, given existing constraints, will be inadequate. This situation places the most insightful critics of education in the unenviable position of "nay-sayers" who are able to state with confidence that most of the nostrums which are being advanced will not work, but who are unable to advance workable alternatives. That situation is intolerable, since it selectively encourages those whose perspectives are most limited and discourages those whose broad perspectives support the greatest potentials for valid insights about the problems of education. This paper will attempt to counter that bias by providing a framework which might enable constructive partial solutions without the over-simplifications which have made so many popular proposals unpalatable to professional educators. Specifically, it will advance a professional perspective from which to view the process of teacher education.

In the development of the perspective, it will be necessary to examine certain historical influences which have shaped the school and contributed to some of its current difficulties. That examination will lead to consideration of current realities which exist in the school, including an analysis of the special difficulties which arise from a very poor match between society's expectations and the constraints under which schools must operate. Finally, these considerations will form the basis for an argument that a new kind of professionalism is required for successful teacher function in modern schools, with clear implications for the selection and preparation of teachers.

It seems clear, if one examines the evolution of educational processes across a very long time, that a steady increase in abstraction characterizes that development. The earliest learning experiences, and also the most concrete, undoubtedly consisted of trial-and-error learning by doing the tasks necessary for survival in primitive societies. Hunting and food gathering skills were acquired in the context of direct experience among scattered nomadic groups. Trial and error is a slow, laborious, and often dangerous way to learn, with the result that human populations dependent on that mode of learning did not increase very much in numbers nor progress very rapidly toward improved living conditions. Gradually, however, as more stable social groups began to form, opportunities to learn by observation also increased. This represents a first step in the process of abstraction, since one is learning second-hand rather than obtaining direct feedback concerning the relative effectiveness of varying things one might do in order to survive in a particular environment. Savings achieved by such abstraction are considerable in terms of time as well as the reduced danger to the learner. Augmented by word-of-mouth traditions, a body of knowledge could be developed and transmitted with a fair degree of efficiency by a social group with the language facility and stable social structure needed to support such activities. Learning by hearing about something rather than observing it being done constituted another step in the abstraction process, but that was tempered with regard to survival skills by the fact that learners saw and practiced such skills as well as hearing about them.

System and structure were added to these processes with the development of apprenticeships, which involved direct experience, observation, and listening in the context of systematic efforts to convey a whole set of skills related to successful performance in a given craft. A large step in the abstraction process occurred with the development of the printing press, for now information could be transmitted on a large scale across time and space to learners remote from the referent experiences. This led to another large step in the form of schools as institutions set apart from the daily activities of society for the purpose of learning about things rather far removed from the activities of daily life. (Written communication and schools existed long before the development of the printing press, of course, but mass education as we know it never could have evolved without the press to produce the necessary books.)

Early schools in the United States stayed relatively close to essential skills required for participation in the society of that time because of the crucial role envisioned for education in preparing for effective citizenship in a democracy. However, the abstraction process continued as the Three R's were supplemented by sciences, social studies, and eventually by the whole gamut of offerings available at a modern high school. In many cases, both students and teachers are unaware of direct, real-world applications for particular elements of the curriculum, at least within the confines of the community served by the school.

Similar trends toward abstraction occurred in the roles for which students were being prepared. The large majority of U.S. families prior to 1900 earned their livings directly from the land through the labors of their own hands. Those who were not engaged in farming tended either to provide direct services or to engage in crafts which maintained their direct involvement in the production of an entity with which they remained closely identified. In all of these cases, close contingencies were maintained between preparation for a given role, performance in that role, and consequences experienced because of the quality of one's efforts. However, as technology exerted its influence, automated assembly lines and huge machines replaced the individual craftsman and the wielder of a shovel or hoe in the production of things needed and valued by society. The worker on a mass assembly line found it hard to identify with a particular product or to gain personal recognition for quality work. The operator hired to run a huge machine was affected more by negotiations between management and labor unions that by direct results from his individual efforts. A worker filled a narrow niche in a huge organization without a clear idea of the end result achieved through aggregated efforts, and with extremely limited ability to influence such end results.

With these changes came increasing ambiguity concerning relationships between school preparation and work performance. Many children have only vague ideas about their parents' jobs, and even less certainty about the relevance of school experiences to success in such endeavors. With such loss of functional relationships between adult roles and school preparation, motivation to learn must be maintained for many years on bases quite different from those which once caused a youngster to pay close attention when a respected elder demonstrated an essential skill. Two important roots of current schooling problems are caught up in that difference, as both motivation and the learning process itself are made more difficult by the distance between work and school.

Unfortunately, although radical changes have occurred in circumstances surrounding the educational process, and in the structures of schooling, there have been no comparable changes nor fundamental reconsiderations of the teacher's role and preparation. Early U.S. efforts to educate children took place largely in the context of one-room schools scattered across the countryside within walking distances of childrens' homes. Curricula centered around the basic skills, with gradual accretions around that core as various additional requirements for effective citizenship became evident. Teachers tended to be local women whose preparation in subject matter and pedagogy permitted success only within the narrow expectations of communities supporting those schools. As long as they stayed slightly ahead of the most advanced students in mastery of the content in prescribed textbooks, and maintained strict discipline with the help of parents, community expectations generally were satisfied. Local boards maintained absolute authority over the teacher in all aspects of school operation.

As the population shifted from rural to urban predominance, one-room schools gave way to consolidated village schools and later to huge urban complexes. Governing boards became more remote, exerting their control over the teachers through superintendents, building principals, and increasingly complex bureaucratic structures which grew in proportion to federal, state, and local efforts to make schools responsive to the burgeoning complexity of society. Teacher preparation also changed from two years of "normal school" training to required baccalaureate degrees but, especially at the elementary school level, the predominant pattern continued to involve women with minimal academic exposure to subject matter concentrations working under the supervision of male administrators possessing graduate degrees. This pattern maintained a profoundly authoritarian structure in the educational system, with teachers at the bottom of a long chain of command involving various levels of school administration, local boards, and other local, state, and federal agencies which issue mandates dictating what teachers must do or refrain from doing.

Not surprisingly, this situation exerted powerful influences on the selection and preparation of teachers. Combined with low salaries, it discouraged potential applicants interested in professional careers, resulting in concentration of the least academically talented students in undergraduate teacher preparation programs (Weaver, 1979; Schlechty and Vance, 1981). It also discouraged those who dislike authoritarian relationships and desire professional autonomy or lattitude for independent judgment in the conduct of their work (Moellenberg, 1976). Students in those programs tend to be concrete in their orientations toward the task of preparing to become teachers, demanding specific examples of practical applications and disliking abstract philosophical, theoretical or analytical issues which might have provided bases for professional practice (McKenna, 1976).

This situation inordinately complicates the problems already described, since the problems faced by educators have become both complex and indeterminate (Schön, 1984), clearly requiring flexibility and adaptability on the part of a successful teacher. Yet, as Harvey (1966) and others have noted, the concretistic individual thrives only in situations involving structured routines, predictable outcomes, and prescribed goals. The modern classroom with its many sources of diversity, unpredictability, and complexity is a very poor setting in which to seek the structured certainty desired by those who function in the concrete mode. The result is dissatisfaction, "burnout," and possibly even the "learned helplessness" which results from persistent inability to perceive relationships between one's efforts and desired outcomes (Roth, 1980). Clearly, the old models of teacher behavior, together with the patterns of selection and preparation of teachers, need revision in the light of the extreme ambiguity and complexity which characterizes the task faced by the teacher in a present-day school.

At the risk of appearing to oversimplify this complex situation, it appears that the problem must be addressed on three fronts. First, a new type of applicants must be recruited into teacher education in order to provide new potential for the kind of adaptability and problem-solving capability which Harvey (1966) and Schön (1984), among others, view as the basis for successful professional function in modern educational settings. Second, these applicants must be supplied with intellectual tools which will permit them to function as true professionals. Third, they must be placed in school situations which provide both autonomy and resources necessary to build new ways of bridging the increasing gap between school learning and real-world problems. Implications of each of these requirements will be explored in order to identify the steps which must be taken if they are to be met.

With regard to recruitment, very significant problems must be faced, for it is clear that applicants of the quality required will not come forward without substantial improvements in current conditions. Important among necessary changes will be financial reward and autonomy at least somewhat more commensurate with the difficult of teachers' tasks. Clearly, those will not reach levels enjoyed by other professionals, even though challenge and importance are at least as great, but signifanct improvements must be made before important changes can be made in the quality of teacher ranks.

The second requirement relates directly to the first, in that quality professional preparation will not be possible without qualified applicants, but it will be necessary in order to retain aspiring professionals once they can be induced to apply. The defining characteristics of a professional are the ability and autonomy required to diagnose problems and prescribe remedies based on the possession of specialized knowledge. Without both characteristics, teachers function as technicians, carrying out the instructions of others or following set routines with little awareness of reasons or consequences attending their actions. That situation is not acceptable in current school contexts, since the pace of change, diversity of expectations, and complexity of emerging problems preclude running off behaviors dictated by others or planned on the basis of static conditions. Good teaching requires a degree of responsiveness to student initiations that is utterly incompatible with the "schoolmarm" image and the "training" mode which accompanied it. To function effectively in the conditions found in modern schools, teachers must be in command not only of the subject-matter content of their courses, but also of principles dealing with human development, learning, motivation, discipline, measurement, computer utilization, and other areas bearing on effective instruction. All of these must be mastered much more thoroughly than most Education graduates have done in the past if professional autonomy is to be justified.

The third set of requirements, autonomy and resources, will become possible only when the first two have been achieved, in that teachers must possess the requisite abilities before the public can be persuaded to grant them opportunities to function as true professionals. This has characteristics of a chicken-or-egg problem, in that the necessary numbers of applicants with professional potentials can not be recruited and prepared without reasonable promise of professional stature upon completion, so both aspects must be addressed simultaneously. The sheer size of the educational establishment precludes major mass advances, so demonstration programs will be necessary in order to prove that such changes are both possible and desirable.

A promising beginning has been made at the University of New Mexico in the form of an experimental program to certify liberal arts graduates from St. John's University in Santa Fe. These scholars already possess impressive intellectual and academic qualifications, so they require only specialized professional preparation in order to become the kind of broad-based educators required to demonstrate true professionalism. They are motivated to become teachers in spite of the lack of inducements, partly because of difficult employment conditions and partly because of special personal interests in the field of education. If they can be placed in situations which afford opportunity to actualize their potentials, effective demonstration of the advantages to be found in this model of teacher preparation may be achieved.

It would seem to be groups like this who offer the greatest promise for bridging the gaps which have developed between school and society, for these scholars have demonstrated their own capabilities in the area of abstract reasoning. Lawson (1982) has noted how essential such ability can be in dealing with science concepts, and it appears to be at least as important for teachers who must deal with complex, ambiguous emerging problems in our schools.

Instructional resources pose yet another set of problems, of course, for it is not yet clear what will be required to motivate students and to foster the development of skills required for successful participation in modern society. Computers offer challenging potentials with their capabilities for simulation, realistic problem-solving experiences, and exploratory learning, but those potentials are only beginning to be developed. In any case, the focus of the current discussion is not the content of future educational programs, but rather the preparation of educators who can devise appropriate programs. It seems clear such educators can not be "trained," with all that such a term implies, but rather that they must be professionally prepared to function as autonomous problem-solvers if future schools are to meet the emerging needs of our society.

REFERENCES

1. Harvey, O.J. (1976). System structure, flexibility, and creativity. In O.J. Harvey (Ed.) Experience, structure and adaptability. New York: Springer

2. Lawson, A.E. and Renner, J.W. Piagetian theory and biology teaching. The American Biology Teacher, 36, 336-343.

3. McKenna, F.R. (1976). Piaget's complaint--and mine: Why is there no science of education? Phi Delta Kappan, 58, 405-409.

4. Moellenberg, W.P. (1976) Characteristics of applicants to teacher education. Unpublished monograph, University of New Mexico, 1-76.

5. Roth, S. (1980). A revised model of learned helplessness in humans. Journal of Personality, 48, 103-133.

6. Schlecty, P.C. and Vance, V. (1981). Do academically able teachers leave education? Phi Delta Kappan, 63, 106-112.

7. Schön, D.A. (1984). Toward a new epistemology of practice: A response to the crisis of professional knowledge. Massachusetts Institute of Technology, 1-29.

8. Weaver, W.T. (1979). In search of quality: The need for talent in teaching. Phi Delta Kappan, 46, 29-32.

COLLABORATION INSTRUCTION IN MULTI-DISCIPLINARY SETTING

by

Thomas A. Musiak
Kansas State University

COLLABORATION EDUCATION IN A MULTIDISCIPLINARY SETTING

by Thomas A. Musiak
Professor and Head

Department of Landscape Architecture
College of Architecture and Design
Kansas State University

This summer the Fund for the Improvement of Postsecondary Education awarded a grant to Kansas State University to conduct a study dealing with collaboration instruction in professional programs. The project is co-directed by Professors Eugene Wendt and Thomas A. Musiak. In this paper which deals with this topic I plan to discuss the need for collaboration, expectations for the project now underway, the nature of collaboration, learning transfer, project strategy, and impact in other settings.

THE NEED

The collaboration (or lack thereof) issue, with us in its persistent, tough-to-crack form for decades, touches most professions. Many encourage it as a concept (Eckbo, 1969; Marshall, 1982, 1983), but few have been able to achieve it.

One such advocate has been Garrett Eckbo, the noted California landscape architect. "Design solutions today," he laments, "are complicated and frustrated by the multiplicity of design fields and their lack of adjustment to the true areas and boundaries of the problems which they purport to solve. Spaces within buildings are single design problems which are attacked by a multitude of decorators, artists, furniture designers, lighting consultants, weavers, ceramicists, kitchen and bathroom consultants, and so on. Parcels of real estate are single design problems which are attacked by architects, engineers, and landscape architects or by their commercial or amateur equivalents. Neighborhoods, communities, regions, and other geographic or topographical units are single design problems which are attacked by the entire complex of social forces and processes that use the land on a competitive basis, within the framework of master plans, zoning ordinances, and subdivision controls. (Eckbo, 1969)

Eckbo continues, "This brings us back to the coordination of the professions. Teamwork on small jobs today is training for teamwork on big jobs tomorrow. Problems of relations between professions are parallel to those of relations between groups of people on a national scale and between nations on a world scale with which we are preoccupied today. The parallelism lies in the choice between pursuing narrow self-interest in blind competition and pursuing broad self-interest in enlightened cooperation. It is not so much a question of collaboration or competition as of how to have both together, and what kind of each. Collaboration between architecture and landscape architecture is inherent in every land development problem in which buildings do not cover 100 percent of the site. Collaboration between architecture and interior design (interior architecture) is inherent in every building problem. Yet, how often does it take place?" (Eckbo)

To the client the results of non-collaboration may range from simple annoyance to a threat to human health, safety or well-being.

At a small scale, Peter Blake, the architectural editor and critic, in referring to chairs designed by noted architects describes the chairs this way: "The Le Corbusier/Perriand chair is an object of absolutely dazzling perfection ... — an object as sexy as the sassiest sports car ..., a pleasure to behold. It is not, however a pleasure to "besit". In fact this particular chair, and others of its vintage, ... appear to be a boon primarily to chiropractors. They (chairs) hold the human frame as if in permanent traction; they bruise the human skin each time one skirts too closely to them. And that, quite often, is not all; some of the most beautiful chairs ... have a way of expelling their occupants tableward by tilting forward in an unexpected avant motion ..." (Blake, 1971)

At the other extreme is the Pruitt-Igoe housing project in St.Louis, a classic, horrible example of design without collaboration -- in this case design without behavioral scientists among others. Built in the 1950s, this large, low-income, housing project was hailed as a truly enlightened scheme and received numerous design awards. The project's design so totally disregarded the needs and behavioral expectations of its inhabitants, however, that it became a menace to human life. Less than 20 years after its completion, many of the buildings were dynamited to remove them from the landscape. (Blake, 1971)

We could try to change this situation out there or we could try in the schools. Several years ago in Washington was organized the Interprofessional Council of Environmental Design (ICED), a response by the combined leadership of the environmental design professions to identify and solve mutual or overlapping problems. ICED brings together a wide variety of design professional associations: architects, landscape architects, planners, and engineers. This organization is dedicated to the proposition that the complexity and magnitude of present-day building and our living environment demand collaboration among all the environmental design professions. (Marshall, 1983) Despite this gesture, little result is visible, a fact that suggests that collaboration as a skill is sufficiently complex yet fundamental and that simply prescribing collaboration does not make it happen.

Significant collaboration has not occurred because collaboration skills and a collaborating attitude have not been learned. These necessary learning objectives are occasionally programmed into a professional's post-secondary education, but obviously that is insufficient.

Moreover, the collaborating attitude, like all learning objectives which lie in the affective domain, is challenging to teach and even more difficult to assess. Unfortunately, few environmental design educators have either collaborative education or experience. Those who do usually find their best efforts to introduce meaningful collaborative experiences to their students frustrated by academic barriers which place each environmental design specialty in separate departments, and often in separate colleges, thus making meaningful education a herculean task, if not an impossibility.

EXPECTATIONS

We can't do much at this point for current practitioners; we believe we can do a great deal for students, our future practitioners. If we improve the administrative organization of professional education programs, and if we can develop more effective collaborative skills and attitudes in our studios, we can expect to see the following things happen in a predictable chain of events:

1. Within Kansas State University's College of Architecture and Design effectiveness will gain wide support to formalize without external financial support the strategy in this study, and ...

2. Invaluable documentation for a successful collaboration education strategy will be made available to a host of colleges and universities for implementation, which will...

3. Increase the supply of very effective design collaborators in the environmental design professions, which will...

4. Effect the utilization of the combined talents in a collaborative way of environmental designers who can more effectively address the design of the built environment, and which will then...

5. Improve the nation's quality of life in the built environment while respecting the natural environment.

THE NATURE OF COLLABORATION

Most organizations and social systems in Western society currently utilize hierarchical structures resulting in competition as a major value system. The antithesis of competition is collaboration. (Kraus, 1980)

Collaboration, on the other hand, involves perception, values, expectations, assumptions, behaviors, structures, processes, and outcomes.

Collaboration is a cooperative venture based on shared power and authority. It is nonhierarchical in nature. It assumes power based on a knowledge or expertise as opposed to power based on role or role function.

People who are able to function in a collaborative way are those individuals who are aware of themselves: who they are, what their skills are, and what "pushes their buttons." They are aware of their own mechanisms for need satisfaction and thus do not exploit others in a destructive fashion. They do not need their role or title to tell them who they are or what they can do, or even what they should do. They do, however, behave in ways that demonstrate caring and concern for others in a nonmanipulative fashion. They care because of what the other person gains, not because of their own personal gain. At the same time they do not sacrifice themselves in the process. (Kraus, 1980)

By comparison and illumination, collaborative organizations are those which exhibit similar traits:

Utilize shared power and responsibility.
Involve a high degree of participative decision-making.
Are nonhierarchical in nature.
Focus less on roles and more on functions.
Involve decisions by function rather than role.
Foster decisions being made by those who must implement them.
Are operated as open systems.
Recognize the uniquely ordered perceptual field of each individual.

Have built-in mechanisms for self-renewal (both individual and organizational).

Recognize the need for continual ongoing processes of feedback, evaluation, and modification (both individual and organizational).

Recognize the value of process as well as input and output.

Foster mechanisms for building, recognizing, and supporting independence.

Recognize and support multigroup membership.

Utilize conflict-resolution strategies based on problem-solving methodologies rather than arbitrary resolution or political methodologies.

Foster a high degree of individual control over the immediate work environment.

Function with a common value base that influences organizational and individual behavior.

Share a common frame of reference with regard to the appropriateness and utility of a collaborative mode of operating. (Kraus, 1980)

Unfortunately, the school systems in the United States are major perpetrators of the competitive model of functioning. The research literature completed in these settings illustrates some rather startling results. The evidence indicates that most students perceive school as being competitive (Johnson, Johnson, and Bryant, 1973; Johnson, D. W., 1973; and Johnson, R. T., 1972); that American children are more competitive than are children from other countries (Madsen and Shapira, 1970; Madsen, 1971; Kagan and Madsen, 1971, 1972; Nelson and Kagan, 1972); that American children become more competitive the longer they are in school or the older they become (Nelson, 1970; Madsen, 1971; Nelson and Kagan, 1972; and Madsen and Connor, 1973); that Anglo-American children are more competitive than are other American children, for instance Mexican-American and Afro-American children (Madsen and Shapira, 1970; Kagan and Madsen, 1971); and that urban children are more competitive than are rural children. (Madsen, 1967; Shapira and Madsen, 1969; Kagan and Madsen, 1971, 1972; Miller and Thomas, 1972; and Nelson and Kagan, 1972)

Is there any question, then, why collaboration is not more prevalent in the classroom, laboratory, and office?

The reward systems are at the hearts of the divergent outcomes.

Generally, the developmental reward path in collaboration is one that moves from tasks with little complexity, simple processes, and structural components with little interdependence, to tasks that are complex and require highly complex structures and processes. (Kraus, 1980)

The processes of interaction in a competitive system differ greatly from those in a collaborative system. In nature the two are more mutually exclusive than compatible. A competitive system ties conflict to hierarchy. It emerges as competition for perceived scarce resources of status, prestige, and power.

LEARNING TRANSFER

The common mode of learning in the environmental design fields is the studio, and the transfer of the studio learning experiences to the professional work environment is the manner in which interdisciplinary collaboration is expected to be achieved.

The studio as a place of teaching-learning is the most common form in the design professions It is characterized by 15 to 25 students assigned to work stations ideally on a permanent basis for at least the duration of a semester. Although occasionally team taught — especially larger ones — usually one instructor is assigned to each. Design project statements with design objectives and criteria for design development are provided each student by the instructor. Student work is normally expected to take place in the studio. The one-to-one contact, which the studio provides, allows interaction of minds to help create the learning experience. Variations frequently occur, as students learn considerably from their peers as well. The studio approximates closely the professional design office.

Learning transfer occurs when a person's learning in one situation influences his learning and performance in other situations. Transfer is dependent upon methods of teaching and learning that use lifelike situations. (Bigge, 1982) Whenever the person recognizes the new situation as similar to other situations for which the behavior has been appropriate, transfer of that behavior pattern is likely to occur. There are numerous unanswered theoretical questions about how transfer takes place, but it is agreed that all responses are helped or hindered by accumulated experience. (Cronbach, 1963)

Moreover, research consistently shows that transfer is real, and that transfer is not limited to closely similar situations. Transfer of a behavior is likely whenever the person recognizes a new situation as similar to other situations where the behavior has been appropriate. What is learned and what is transferred depends upon the teaching method; the same subject taught differently may produce great or little transfer. Cronbach further states that the transferable outcomes include specific action, specific facts, broad concepts, and generalizations, techniques of analyzing situations, attitudes toward the subject or the situation, and attitudes toward the self. (Cronbach, 1963)

The teaching studio, then, as a close approximation of the professional design studio, and transference of the learning of collaboration skill and attitude are the principles by which this project expects to achieve significant results in the practicing environmental designer.

THE STRATEGY

The building of the educational design to professionalize collaboration skill requires strategic planning to overhaul the professional designer curriculum in favor of interdisciplinary design studios with collaboration instruction. The most effective places to accomplish this are in the beginning years to provide common design education, and in the last year to develop and integrate collaboration skill and mindset. At the beginning students would gain familiarity and understanding. At the latter point in the students' education they have sufficient knowledge and vocabulary to identify with their chosen professions and to contribute meaningfully with their colleagues.

In 1972 the College of Architecture and Design at Kansas State University took a first step in the integration of environmental design education when the College was reorganized in a 2+3 year curriculum structure. The program provides for two years of interdisciplinary professional education in the Environmental Design Department (formerly Pre- Design Professions or PDP) followed by three years of specialized professional education in one of three degree-granting departments, i.e., Architecture, Interior Architecture, or Landscape Architecture. (figure 1A)

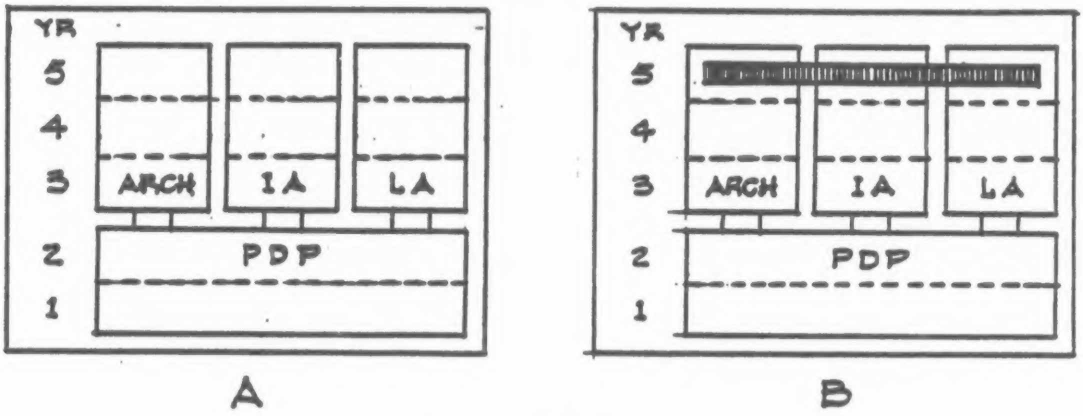


FIGURE 1

The benefits of this structure have met most of our expectations. It is anticipated that the results of this experimental program will show that an educational structure which starts environmental design students in combined studios followed by separation for specialized study, and then brings the students back together for a final combined studio experience will result in dramatically increased aptitude for and commitment to collaborative professional work. (figure 1B)

The heart of this study are trial modifications to the fifth year of the curriculums. The plan is to form an interdisciplinary studio in the first semester of the fifth year (figure 2) to be staffed by an instructional team composed of one faculty member from each of the three departments.

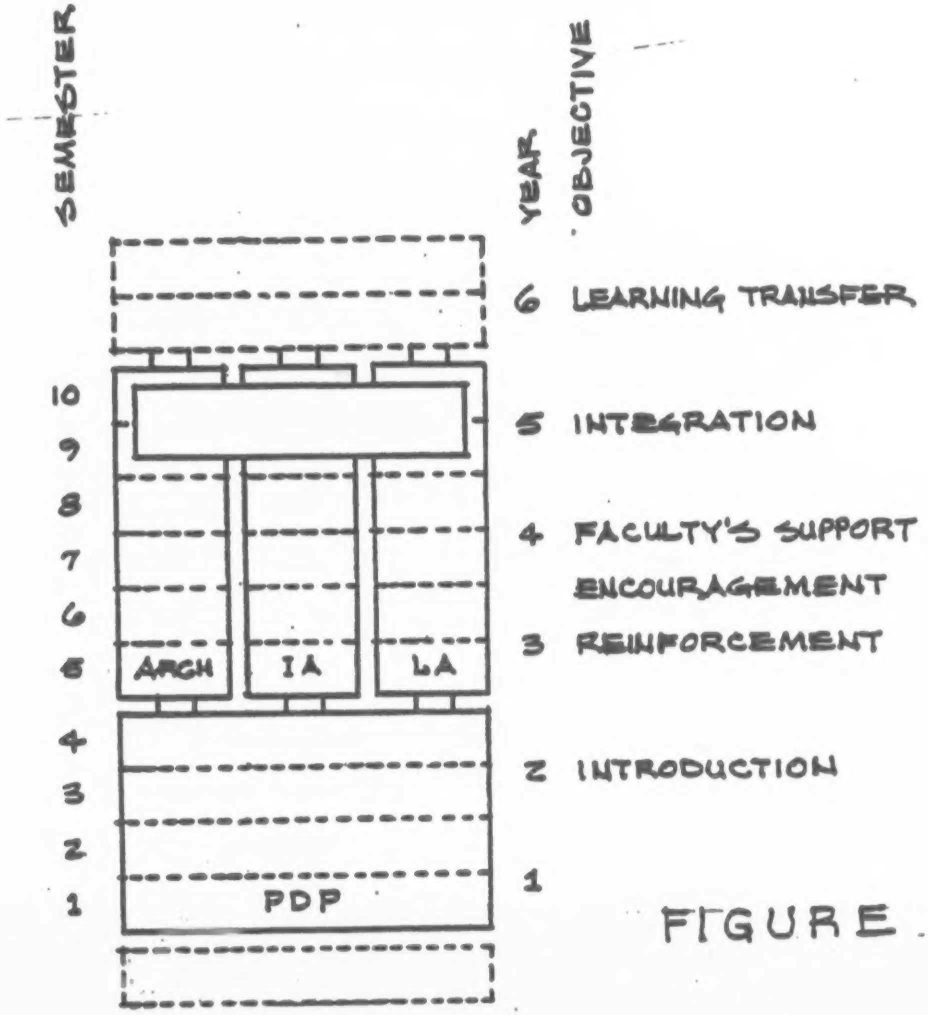

SEMESTER
YEAR
OBJECTIVE
6 LEARNING TRANSFER
10
9
5 INTEGRATION
8
7
4 FACULTY'S SUPPORT
ENCOURAGEMENT
6
5
3 REINFORCEMENT
ARCH
IA
LA
4
3
2 INTRODUCTION
2
1
1
PDP

FIGURE 2

This studio runs concurrently with the usual studios in each department. Approximately twenty-four students are randomly selected from the fifth-year group with a balance between architecture, interior architecture, and landscape architecture students, and typical gender and minority percentages.

At the conclusion of the experimental collaboration studio, the students return to their usual final semester of thesis project with one difference. In addition to his or her usual faculty thesis advisors, each student has as peer consultants one experimental group student from each of the other two specialty departments. Likewise, each experimental group student serves as a peer consultant for one experimental group student in each of the other two specialty departments.

Fifth-year students completing the usual program constitute the control group. Both control group and experimental group students are evaluated by instrument at the beginning of the semester and again at the conclusion. Additionally, the students participating in the experiment are tested again one year after graduation. As a check on the program and as a means of comparison, testing of a cross-section of practicing professionals in all three environmental design fields is conducted.

Implementation of this study requires two major consultants. One is a person to provide collaboration (conflict management) assistance for the teaching team. The other is a person to assist in the development and administration of the evaluation instrument and the interpretation of the results of evaluation.

Ideally while the integration takes place in the fifth year, two other activities happen simultaneously. In the third- and fourth-year studios (Architecture, Interior Architecture, and Landscape Architecture) faculty development seminars are conducted so that faculty of the degree-granting programs may support, encourage, and reinforce. In the second year (Environmental Design Department) studios other faculty development seminars take place to initiate the process and the understanding to allow those faculty to implement the introduction of collaboration to students. The students are exposed to collaboration the following spring.

As feedback is gathered from the fifth year activities, adjustments are made to the introduction to collaboration in the Environmental Design Department. After four years, we expect this longitudinal study to feed back into the system on a continuing basis. New faculty will be assimilated with on-going faculty development seminars.

In actuality work on the project commenced before the official starting date in August, 1985. Potential class projects had to be investigated and developed. Because there was no known testing instrument, the evaluation consultant had to developed and pretest one. About 125 students coming into their fifth year in the College had to be informed and invited to participate. Faculty had to be chosen and made part of the class planning team. The collaboration consultant had to be preparing for her two workshops with the studio.

To insure high student motivation only those who responded affirmatively to the summer-mailed invitation were included in the selection pools, about half of the respondents. Random selection of eight students from each of the three pools brought the class size to 24 with the expected variances in gender, race, and ability as evidenced by grade point averages. Initial testing of the subjects occurred in the first week of classes and included the unselected students as the control group.

The three faculty were selected on the basis of teaching as well as professional practice experience and a collaborative predisposition. The collaboration consultant's qualifications which were important to the experiment were neutrality, or non-alignment with any of the three disciplines represented, and of course expertise in conflict resolution, team building, meeting facilitation, and public involvement -- the key ingredients of collaboration.

The semester was set up in three modules of three, five, and five-- week lengths to allow the completion of three class projects by each student team, randomly constituted. Except for the first project, the teams selected from a choice of two or three projects for the second and third modules. Projects ranged from a medium security jail and community facilities development to campus projects and a hypothetical working environment called "flexiplace".

IMPACT IN OTHER SETTINGS

Kansas State University's good fortune to have in place an academic structure which is conducive to conducting this study should not preclude others from benefiting as well. Few professions are untouched by the need or desire for collaboration interprofessionally. Hence, this study should be valuable in many other settings through the transfer of the core pedagogy on collaboration. A few examples:

Within the environmental design fields in those schools in which the disciplines are not within the same academic unit.

In health care delivery settings.

In engineering.

Within any university to cross college boundaries.

In short, in any setting in which disciplines work or should work together to solve problems.

SUMMARY

While it is more convenient for Kansas State University than for most others to conduct this study, we hasten to point out that this model, if proven successful, could be transferred to all schools with an interdisciplinary collaboration objective.

In the first two years in the Environmental Design Department we would introduce and practice the skill and technique of collaboration. We would at the same time train faculty of the three degree-granting departments so they can monitor and support good collaboration behavior in the third and fourth years. In the fifth year we would integrate into the studio repertoire a team teaching both design skills and collaborative skills. Additionally in second semester of fifth year, we would require all students taking part in the previous collaboration studio to conduct his/her independent thesis project with two consultant students who are from that studio and who are in the other disciplines.

We infer from the fact that these students upon graduation go out to a variety of positions in offices across the country that the initial impact could be both immediate and far-reaching. It is also expected that students upon graduation will not only behave in a more collaborative way, they will also use their special knowledge in making their selection of employment.

REFERENCES

Bigge, Morris L. **Learning Theories for Teachers.** 4th ed. New York, New York: Harper and Row, 1982, 252.

Blake, Peter. **Form Follows Fiasco.** Boston, MA.: Little, Brown and Company, 1971, 137-138, 154

Cronbach, Lee J. **Educational Psychology.** New York, New York: Harcourt, Brace & World, Inc., 1963, 318-319.

Eckbo, Garrett. **The Landscape We See.** NY: McGraw-Hill Book Co, 1969. 176-184

Johnson, D. W. **Student Attitudes Toward Cooperation and Competition in a Midwestern School District.** Unpublished report, University of Minnesota,1973.

Johnson, R. T. **Cooperation in the Elementary Science Classroom: Perception and Preferences of Sixth Grade Students.** Univ of Minn, Mimeographed report, 1972.

Johnson, R. T., Johnson, D. W. , & Bryant, B. "Cooperation and Competition in the Classroom: Perceptions and preferences as related to students' feelings of personal control". **Elementary School Journal,** 1973. 306-313

Kagan, S. and Madsen, M. C. "Cooperation and Competition of Mexican-American and Anglo-American Children of Two Ages Under four Instructional Sets". **Developmental Psychology,** 1971, 5. 32-39

Kagan, S. and Madsen, M. C. "Rivalry in Anglo-American and Mexican Children of Two Ages". **Journal of Personality and Social Psychology,** 1972, 24. 214-220

Kraus, William A. **Collaboration in Organizations.** New York, New York: Human Sciences Press, 1980.

Madsen, M. C. "Developmental and Cross-cultural Differences in Cooperative and Competitive Behavior of Young Children". **Journal of Cross-Cultural Psychology,** 1971, 2. 365-371

Madsen, M. C., and Shapira, A. "Cooperative and Competitive Behavior of Urban Afro-American, Anglo-American, Mexican-American, and Mexican Village Children". **Developmental Psychology.** New York, NY: Teachers College Press, 1970. 16-20

Marshall, Lane L. **Action by Design.** Washington, DC: American Society of Landscape Architects, 1983, 105-118.

Marshall, Lane L. ed. **Landscape Architecture into the 21st Century.** Washington, DC: American Society of Landscape Architects, 1982.

Miller, A. G. and Thomas, R. "Cooperation and Competition Among Blackfoot Indian and Urban Canadian Children". **Child Development,** 1972. 43, 1104-1110

Nelson, L., and Kagan, S. "Competition: the Star-Spangled Scramble". **Psychology Today,** Sept 1972. 53-91

KNOWLEDGE FOR THE FUTURE: A PRIMER ON ARTIFICIAL INTELLIGENCE FOR EDUCATORS

by

Eugenie Potter

Arizona Research Associates

KNOWLEDGE FOR THE FUTURE: A PRIMER ON ARTIFICIAL INTELLIGENCE FOR EDUCATORS

by Eugenie Potter

The field of artificial intelligence is relatively new, dating from the development of the first digital computer around World War II. The term "artificial intelligence" came into being at a conference in 1956 at Dartmouth College in New Hampshire. At this conference researchers in various areas of computer science exchanged notes via presented papers and informal discussions on their work in progress.

A number of the scientists were engaged in an attempt to build a universal thinking machine using the knowledge gained from the linear logical processes of computers, as well as to test the theories about the computational nature of mental processes proposed by the mathematician Alvin Turing. It was in this context that John McCarthy coined the term "artificial intelligence" to denote the product of such research (1). The term was meant to highlight the parallel nature of such a product to "natural" intelligence, meaning that done by biological beings.

The concern for developing a machine intelligence derived from the classical philosophical problems of epistemology, the study of the nature of knowing. Just as earlier mechanical devices were used as models for thinking about thought processes, in the latter half of the 20th century the computer offers a model for thinking about thinking.

To many researchers, the step-by-step rigorous logical processes of computer programs, combined with strict definitions of terms, demonstrate the way a highly informed human being solves conceptual problems. In addition, the electrical impulses that control the binary digital computer seem, at least to some, to replicate the synaptic operations of the human mind. Thus the computer appears to imitate some of both the physiological and psychological processes of human thought.

Computing machinery, which is to say both the hardware and the software that controls it, is central to inquiries in artificial intelligence and the closely linked field of cognitive science. I'll define each, beginning with the over-arching area of cognitive science.

A brief definition of cognitive science is given by Gardner in his book The Mind's New Science as "a contemporary, empirically based effort to answer long-standing epistemological questions" (2). This definition, however, requires some historical unraveling.

As noted earlier, the principal concerns of classical epistemology -- what do we know, how do we know, how do we know that we know -- continue to occupy the thinking of many researchers. In this century the dominant explanatory frameworks for these questions were to be found in the philosophical school of logical empiricism and in the psychological school of behaviorism.

Logical empiricism relies on the analysis of language usage and the conversion of linguistic expressions to the symbolic notation of mathematical logic to make propositions about the world clear, unequivocal and verifiable. Behaviorism relies on the theory that conditioning and reinforcement from the environment determine the knowledge an organism has about the world, and that possession of such knowledge can only be verified through the manifest behavior of the organism. The behaviorists reject explanations of subjective, introspective processes such as intentions, purposes, and volition.

The programs of logical empiricism and behaviorism have both proven fruitful in advancing thinking about human thought processes, but both have also been found wanting as complete frameworks. The need to account for contrary information deriving from other inquiries in philosophy, psychology, the other social sciences, the biological sciences, and from computer science gave rise to a new interdisciplinary effort called "cognitive science."

Gardner states that there are five features of paramount importance to cognitive science:

1. the necessary concept of mental representations that exist apart from biological or cultural constructs,

2. the centrality of the computer to understanding the human mind,

3. the de-emphasis of emotions, historical and cultural factors, and the role of background context in cognitive functioning

4. the necessity for interdisciplinary studies drawn from philosophy, psychology, artificial intelligence, linguistics, anthropology and neuroscience, and

5. the centrality of classical epistemological concerns to the cognitive science set of issues (3)

Thus cognitive science is a new attempt to understand how biological organisms, especially humans, can know anything about the universe. This research has major implications for education in that our central endeavor is to teach others about the universe, both the physical world that surrounds us and the conceptual world of non-material culture. Cognitive science may eventually give us some means for devising better methods and tools for our enterprise.

Turning now to the area of artificial intelligence, we've noted Gardner's statement that the computer is central to the understanding of the human mind as far as the cognitive scientists are concerned. It might have been better for Gardner to have said that the computer as intelligent machine is central to the understanding of the human mind. Why should this be so?

Artificial intelligence research is the attempt "to design intelligent computer systems, that is, systems that exhibit the characteristics we associate with intelligence in human behavior -- understanding language, learning, reasoning, solving problems, and so on" (4). In order to devise such systems, it is necessary to understand how humans carry out those same processes. Thus the underlying agenda of artificial intelligence research is the same as that of cognitive science: to answer the classical epistemological questions.

As Feigenbaum said in the Handbook of Artificial

Intelligence:

> The excitement of creating a powerful new technology is coupled in AI, as perhaps in no other field these days, with the potential for stumbling upon new insights into one of the *big* questions: Physicists ask what kind of place this universe is and seek to characterize its behavior systematically. Biologists ask what it means for a physical system to be *living*. We in AI wonder what kind of information-processing system can ask such questions" (5)

If the agendas of cognitive science and artificial intelligence overlap, how do they differ? The answer lies in the goals and methods each sets out. Cognitive science aims to understand human cognitive processes and draws from many disciplines, including artificial intelligence, to do so.

Artificial intelligence research, on the other hand, seeks to design a machine intelligence whose processes may or may not mimic human cognition. In fact some AI researchers believe the human mind to be a faulty and misleading model for the AI effort. They would prefer a unique theoretical paradigm that would refer only tangentially to the human one.

Although AI research draws from advances in knowledge in the same disciplines as does cognitive science, it is essentially tied to computer science as its fundamental discipline. Finally, cognitive science is now and is likely to remain for some time to come an academic endeavor, largely confined to theoretical considerations. By contrast, artificial intelligence is already making its way strongly into the public and private marketplace.

It is used in capital-intensive private industry to cut costs and to preserve expert knowledge. It is being used increasingly by the federal government in military, space, and domestic applications. One of the more interesting of the latter is the encoding of Internal Revenue Service rules and regulations into AI programs known as "expert systems."

Let us now concentrate on artificial intelligence in outlining the major areas of research. These fall into essentially four fields that can, and occasionally do, overlap. They are knowledge-based systems, also known as expert systems; robotics; perception systems that include vision, motion, smell reception, and audio reception; and the field of natural language understanding.

Knowledge-based systems encode the knowledge of one or more experts in a given specialty into a computer program. The expert knowledge contains not only factual matter, but also matters of process: the rules of thumb and other principles of judgment that the expert uses to make inferences and to solve problems.

Such systems differ from ordinary computer programs in that, first, they include such judgment "heuristics" in contrast to the more limited rule sets of conventional programs; second, they are "transparent" in their reasoning, meaning that they will give the user a track of the judgment process if queried; third, their structure often lends itself to generic use. That is to say, the specific knowledge base and judgment rules can be dropped out, while the structure for encoding other knowledge and rules and for making inferences about them remains in place. The last important characteristic of sophisticated knowledge-based systems is that they are capable of "learning," that is, new knowledge and rules can be added to the system and the program will make inferential connections to the older knowledge and rules, sometimes devising "new" knowledge and rules.

The basic idea of robotics is fairly well known, particularly as it is applied in industry: making a machine do the repetitive tasks that once required human muscle. The control systems behind robots, however, rely on research in the third area of AI: perception systems.

Perception systems require intensive investigation into the mechanisms for movement, vision, olfactory reception and audio reception. Industrial robots developed principally from motion research. Some rely on primitive vision systems to detect differences in patterns or movement. A retrieval arm under development for the space shuttle, for example, must be able to combine motion and a form of binocular vision to follow and catch a target.

Not all perception systems are incorporated into robots, however. There are devices now being tested that monitor air for chemical leaks by using olfactory receptors. Had the chemical plant at Bhopal, India, been equipped with such a system, even at the currently primitive state of development, the disaster that killed so many last year might have been averted.

The great hope of many users and would-be users of computers is to be able to talk directly to the machine without having to enter information through a keyboard or a mouse. That hope is already being realized with the advent of limited voice recognition machines. Currently the machines can be "taught" to recognize a small number of voices, but will not recognize them if they are altered by such things as colds or weariness. The machines also have limited vocabularies, but are capable of learning more.

This brings me to the last research field: natural language understanding. Machines capable of recognizing voices have, in a sense, the ability to understand natural language, which is to say, the open language of ordinary discourse, in contrast to the restricted terminology of conventional computer programs.

Voice recognition, however, is a small part of the fundamental aim of natural language understanding, which is to enable a machine to fully comprehend and use the vocabulary, grammar and varied meanings of language. Some programs now in the marketplace are used successfully to translate technical documents whose vocabulary and grammar are highly constrained. Where a skilled human translator could complete up to eight pages each day, that same translator, using a computer program, can finish nearly 30 pages, a productivity increase that promises an even greater global distribution of information and knowledge.

Research in all of these areas will be aided by changes in the computing machinery itself. Currently computers handle data bits through serial processing. That means that the machine's central processing unit controls the flow of bits in a one-by-one-by-one fashion, much like a super police officer directing eight lanes of heavy traffic across a one-lane bridge.

In the future, computers will process data in modularized and parallel fashion. That means that certain areas of the machine will handle data independent of other areas and will receive and release their data without going through a central processing unit. This might be likened to the smooth flow of traffic through complex freeway interchanges, although the analogy is limited. Once it is functional, this type of processing is likely to change forever the way we deal with information because it will be possible to make connections between disparate areas of knowledge hitherto prohibited by time, resources, and, perhaps, imagination.

At the present time application of artificial intelligence tools in education is extremely limited, but it need not be. There exist expert system shells that could be used by teachers to develop self-paced learning modules. Similarly, students could be encouraged to use such shells to develop a knowledge base in a constrained subject area, thereby requiring them to truly learn the material in a deeper way than the writing of a term paper might demand.

Children and adults with learning disabilities will no doubt benefit by cognitive science research, but research into perceptual mechanisms will most certainly illuminate our understanding and perhaps suggest remedies for psychomotor difficulties.

In administration the use of expert systems for planning and budgeting as well as for some routine decisionmaking could permit administrators to attend more to the human concerns of their jobs. Such programs could also be used to preserve the knowledge and judgment rules of the best and brightest administrators and others in an institution.

As scholars in various disciplines begin to build expert systems in their respective domains, these systems could begin to be linked across disciplines, political science with sociology with anthropology, for example, yielding the possibility of new syntheses. Furthermore, knowledge-based systems could be used to generate and test new hypotheses about old assumptions.

Lastly, the very process of constructing a knowledge-based system requires the expert to examine closely the ways that knowledge and the rules for operating on that knowledge are formulated and represented. To those who have already given their expertise to a knowledge-based system, that examination process has been the most stimulating aspect of the construction experience, for it has illuminated and clarified their enterprise as never before.

References:

1. Pamela McCorduck, Machines Who Think. San Francisco: Freeman, 1979, p.96.
2. Howard Gardner, The Mind's New Science. New York: Basic Books, 1985, p.6.
3. Gardner, 1985, pp.6-7.
4. Edward Feigenbaum and Avron Barr, The Handbook of Artificial Intelligence. Los Alto: Wm. Kaufmann, 1981, v.1, p.3.
5 Feigenbaum and Barr, 1981, v.1, p.11.

IMPROVING SKILLS OF TEACHING ASSISTANTS

by

Jacqueline Sheehan, Barbara Lindsay, and William H. Matchett
New Mexico State University

IMPROVING SKILLS OF TEACHING ASSISTANTS

Introduction

New Mexico State University offers teaching assistantships to the most qualified graduate students. Ten years ago, a small group of graduate assistants approached the director of the Center for Learning Assistance and requested help in preparing for the first day of class. They came with several of the following questions that all educators will find familiar:

1. I've never taught before. What should I do in order to survive the first class meeting?
2. How do I grade students?
3. How will I be evaluated?
4. What if I don't know the answer to a student's question?
5. What is the university's policy regarding attendance?
6. What is considered a normal academic load for a graduate student with a teaching assistantship?
7. How friendly should I be with students?
8. How should I handle disruptive classroom situations?
9. What should I do if I suspect someone of cheating?
10. How do I become a skilled teacher?
11. Who is my supervisor?
12. How much work am I expected to perform?
13. How will my performance be measured?

Their expressions of doubt and insecurities were coupled with a lack of clarity about the exact nature of their responsibilities. At the same time, reports had been filtering back from the departments to the Graduate School that TAs were poorly prepared for teaching. At the very least, there was a lack of classroom presence. They were excellent students in their own disciplines, but they lacked teaching skills. Clearly, something had to be done.

THE GRADUATE ASSISTANT ORIENTATION

We believe that much of what is involved in passing knowledge on to others can be learned, practiced, and continually improved. By learning the skills necessary for successful teaching, a new teaching assistant is able to meet the responsibilities of classroom instruction while coping with the inevitable anxieties of life as a graduate student. Successful teaching depends as much on the theory as on the technique used.

Research has identified the following as four elements of effective teaching (1):

1. Good organization
2. Enthusiastic presentation
3. Knowledge of the subject
4. Group instructional skills

Each of these elements can be learned. Teaching these elements to beginning TAs requires an atmosphere of support, respect, and a nonthreatening environment. These attributes instill a sense of pride, confidence, and professionalism in a TA and will surely contribute to effective classroom teaching.

What evolved from all this came to be known as the Graduate Assistant Orientation (GAO). The orientation, which had a modest beginning in 1975, was a three-hour seminar attended by 30 TAs. In 1985, the GAO was attended by over 230 graduate assistants and included events scheduled over a one-and-a-half day period. The aspirations we held for the first seminar ten years ago, remain intact today. They involve the participation of our most experienced professors who model good teaching, acknowledge the difficulty of the TAs' position, and inform them where help is to be found.

Twelve workshops were developed by faculty considered to be master teachers. They were all based on the premise that teaching can be learned, practiced, and continually improved. Workshops were also conducted by experienced TAs who were known to be successful.

One element of successful teaching is good organization. Several workshops deal with this topic. For example, Dr. Karen Smith, one of the founders of the GAO and currently the director of our Center for Learning Assistance, often conducts a workshop titled Delivering Instruction: Some Alternatives to Lecturing. This workshop helps TAs to see that they are not doomed to stand rigidly behind a podium for 16 weeks. Alternative methods to the lecture are considered and the effectiveness of these methods is explored.

A workshop titled How to Develop a Syllabus gives TAs the background and purpose of providing students with a syllabus. The usefulness of a properly prepared syllabus is also considered. We do not expect that beginning TAs will be asked to prepare their own syllabi, but they will surely have to use them and will eventually be required at least to assist in revision or preparation of them.

A major part of organization requires TAs to order the priorities of their own lives, their classes, research, and their teaching assignments. It may appear commendable for a TA to spend 40 hours a week on the teaching assignment but survival in the academic world may be compromised. One workshop that is particularly effective in this area is presented by the director of the University Counseling Center. Her workshop, Stress and the

GA, offers realistic goal and priority setting for all graduate assistants and offers several techniques for coping with stress.

Enthusiastic presentation is an element of effective teaching that has contributed greatly to the myth that "good teachers are born not made" or that only charismatic people can hope to be skilled teachers (2). On the first day of the orientation, the entire assembly of registered graduate assistants attends a workshop called, The Lecture and Lab Method of Teaching. For this important workshop, professors are chosen who have received the highest awards for teaching excellence. The workshop is filled with humor, sensitivity, enthusiasm, and a love of teaching. The workshop emphasizes the concept that like other skills, methods of projecting enthusiasm can be systematically learned. The presenters stress the idea that teaching is hard work but that it is an occupation filled with joyful and fullfilling experiences.

Knowledge of the subject matter is a prerequisite for any TA. The orientation proceeds on the assumption that each TA has satisfactorily mastered his or her subject matter. We have also found that TAs need to understand who their students are, what their level of understanding is, and how far they can be stretched. Our Vice President for Student Affairs presents a workshop on What to Expect From the Freshman Student. She gives the TAs valuable information concerning demographics, race, and socioeconomic origins for the average student entering college.

A panel discussion by eight members of the faculty and staff describes services that are available for all students and faculty. TAs need to be knowledgeable not only about their major discipline and their students, but also about facilities on campus such as library services, counseling services, computer center, statistical services, legal advice, disciplinary policies, and the Center for Learning Assistance.

Group instructional skills are an element of effective teaching that can add variety and spice to the classroom at the university level. An example of one of our workshops that focuses on this area is called Developing Effective Communication. As the title implies, this workshop offers skills in group facilitation by increasing the level of communication not only between students and teachers but also among students. This workshop points out that out of class interactions among students are an important part of university learning.

Each year, new workshops are added and old workshops that no longer seem relevant to TAs are dropped. This year we added Sexism in the Classroom and Indian Cultures of New Mexico.

We don't presume to make TAs into master teachers in a two day period. But in this rather brief and intense orientation, we can stimulate the TAs to seek out help when they need it. When problems do arise in the classroom, the TAs will know where to go for help if their own ideas and resources seem inadequate. Throughout the orientation, we stress the importance and availability of supervision and help from departmental faculty.

PLANNING FOR THE GRADUATE ASSISTANT ORIENTATION

The GAO has gone through a metamorphosis over the past ten years from a small workshop attended only by a handful of graduate assistants to the presently well attended event that is firmly established on our campus. There are several reasons for the success of this program.

The primary reason is the quality of the orientation itself. Our purpose is to provide TAs with excellent role models for university teaching and through the help of our faculty, we have been able to do so.

Secondly, the Graduate Assistant Orientation has been instrumental in communicating to teaching assistants that their feelings of uncertainty are understood by the faculty and the administration. By acknowledging the fears and anxieties of teaching assistants and by giving instructional support and encouragement, we hope to attain the goal of promoting and achieving quality instruction.

Thirdly, the manner in which the Graduate Assistant Orientation is organized has resulted in making it a major event at the beginning of each fall semester. The Orientation is held the week before classes start in the fall. We begin planning during spring semester and continue throughout the summer.

All levels of faculty, staff, and administration are involved and participate voluntarily and enthusiastically in the workshops and social activities. Department heads receive notice of the scheduled date by June and are urged to encourage their graduate assistants to attend. It is important to note that attendance by GAs is also voluntary. All graduate assistants are personally invited by letter from the Dean of the Graduate School. We have considered requiring attendance but we continue to believe that the quality of the orientation would be diminished if attendance were mandatory.

When all workshops have been planned, a tentative schedule is sent to department heads and other administrators so that they can allow time in their own schedules for attending appropriate sessions. Graduate assistants are also given an adequate amount of time to fit the orientation into their schedules.

On the first day of the orientation, students are welcomed by the President of NMSU and the Dean of the Graduate School. The dean outlines responsibilities of teaching assistants and invites them to use the office of the Graduate School for needed assistance. The dean also urges them to make use of the publications Ready, Set, Teach! and the Graduate Handbook. Both publications are edited by the Graduate Assistant Training Coordinator in the office of the Graduate School and are designed specifically for graduate students on our campus.

Ready, Set, Teach!, is a handbook on teaching for graduate assistants. The handbook is a collection of essays on teaching, written by professors at New Mexico State University. Graduate assistants identified what areas the handbook should address and solicited faculty assistance in producing it. Teaching styles, methods and tools are discussed. Copies are available upon request.

The Graduate Student Handbook provides information about the campus, the facilities available, housing, graduate student organizations, instructions on oral examinations and recreational information. The handbook is particularly helpful to graduate students who are new to the campus. Copies of this handbook are also available upon request.

The social aspect of the program is important. The graduate assistants are treated to complimentary coffee and pastries at each workshop. A social hour with beer and refreshments is held at a nearby hotel. At the social, members of the graduate faculty and graduate council, department heads, associate deans, deans, vice presidents and the president are on hand to greet each graduate assistant personally. This is also a time for the new graduate assistants to meet one another and to generate a spirit of comraderie that is so important to graduate training and professional development. Students, faculty and administration are encouraged to get to know one another on a personal level rather than the typical student-faculty relationship which can inhibit personal interaction.

On the last day of the orientation, graduate assistants are invited to a luncheon sponsored by the Graduate School. In order to facilitate personal interaction, great care is taken in orchestrating the seating arrangement. There is no head table, but a ballroom filled with round tables that can seat 8-10 people. In this arrangement, conversation flourishes. Just in case conversation does not flourish, we have provided each table with a facilitator. The facilitator is identified as the person who happens to sit at a place where a saucer has been marked by a red dot. A few moments into the luncheon, GAs are asked to check their saucer for a red dot. The persons so identified are requested to make introductions at their tables. For this service, the facilitators are given a small gift. This acts as a method of promoting friendly interaction and allows students who are new to the University to take the first step toward making the friendships that are so important during their years as a graduate students. Following the lunch, a speaker (usually someone well known in the community) addresses the group on one or more themes covered in the orientation.

Each participant is given an evaluation form to complete. Most changes that we make are based on these evaluations. The respondents are asked to rate each workshop and each social event on a seven point scale. Each respondent is also asked to give suggestions for additional workshops.

A full report is made to the executive vice president and copies of this report are sent to department heads, deans and to each faculty person who was a participant in the orientation. The apparent cost of the orientation is currently about $3500. This is not the full cost since the efforts of faculty members, other graduate assistants and the keynote speaker are donated. Our most significant costs are printing, the luncheon, and the social.

DISCUSSION

We have found a paucity of literature on this subject. Few universities offer a centrally administered Graduate Assistant Orientation (3). Many departments within universities offer training programs for their TAs but these are specific to the discipline represented. Some of the universities that offer programs similar to ours are Stanford University, University of Maryland and the University of Illinois at Urbana-Champaign. Over the past year, we have attempted to set up an exchange of information with universities that present orientation programs for teaching assistants so that we may all learn from each other.

We conclude with some typical comments made by TAs who attended the orientation in the fall of 1985.

> "This was an excellent orientation. More universities should have this type of program. It has given me a sense of welcome, purpose and community as well as good general info. Thanks!"
>
> "NMSU has an excellent attitude toward its students overall and that attitude of concern was emphasized to the GAs. I feel the results will be far reaching. It made me feel at home and increased my desire to promote the school and to give that extra to the students."
>
> "I enjoyed the Orientation tremendously. It helped me to relax and focus. It was a marvelous opportunity to meet students from other areas."

We are pleased with the overall results from our ten-year history of serving the needs of teaching assistants. We will continue to monitor orientation outcomes which include

1. Lack of negative comments from undergraduates
2. More confidence reported by TAs going into their teaching responsibilities
3. Departments have used our orientation as a model for their own training

We would encourage other universities to offer an orientation program to graduate assistants and we hope this presentation will assist you in this effort. Thank you.

BIBLIOGRAPHY

1. Diamond, N. (1983). Improving Your Lecturing. University of Illinois at Urbana-Champaign, Illinois.

2. Schmeissener, J. and Goldhaber, J. (1985). The Graduate Assistant Handbook. University of Maryland, College Park, Maryland.

3. Shack, W. (1980). Handbook for Teaching Assistants. Superior Press, Oakland, California.

RELATIONSHIPS BETWEEN PREFERRED LEARNING AND CLINICAL ACHIEVEMENT OF BACCALAUREATE NURSING STUDENTS

by

Norma Neahr Wilkerson

University of Wyoming

Since the late 1960's baccalaureate nursing curricula have been organizing according to integrated models of nursing practice. Integrated nursing curricula have two major goals: to provide educational experiences which emphasize conceptual constructs unique to nursing, and to emphasize the nursing process that can be implemented in many different settings (Torres, 1974). Integrated nursing courses developed within these curricula require students to learn facts, relate these facts to each other, derive conceptual constructs, apply conceptual constructs to clinical examples, and problem solve in direct clinical care experiences.

In addition, the current registered nurse licensure examination is integrated around the nursing process. Although divided into four two hour parts, there is one score for the total examination. The National Council of State Boards of Nursing adopted an integrated blueprint for use in developing the licensure examination. The blueprint illustrates nursing's interaction with clients in the context of three basic elements; growth and development, lifestyle, and unanticipated events. Such organization of nursing content requires the student to conceptualize nursing knowledge on several different levels. Students must not only learn discrete facts, they must also be able to focus upon general principles in order to formulate deductions in the clinical setting. The needs of students in integrated programs, preparing for an integrated examination may be unique in many ways which are not currently described in the research literature.

While many variables interrelate to influence outcomes in both course achievement and achievement on licensing examinations, there is some theoretical evidence that a student's preferred learning style may have an impact on cognitive achievement. Kirby (1979) suggests that cognitive style and learning style have implications for skill transfer in vocational educational programs. Learning style assessment also provides a framework within which instructional preferences can be examined. Examining differences in learner behavior as a result of the individual interacting with a given environment which occurs in teaching-learning situations provides a framework for describing the way students prefer to learn as well as how this preference impacts upon their achievement.

The purpose of this research is to describe relationships between preferred learning style and cognitive achievement in one nursing course in an integrated curriculum. The specific objectives of this study are to determine if (1) differences in learning style preferences can be demonstated and (2) if they are related to achievement on any of the outcome measures which were defined for this course.

Theoretical Framework

Kolb's model of experiential learning (1976) is used as the framework for hypothesizing differences in achievement as a function of learning style preference in undergraduate students who participated in this study. According to Kolb's model there are four phases in the experiential learning cycle: concrete experience, reflective observation, abstract conceptualization, and active experimentation. Individual learners have distinct preferences for using specific phases of the learning model.

The first phase is concrete experiencing (CE) of a learning situation. The senses are primarily involved as all stimuli from the learning situation are taken in as input. Sensory modes are utilized to gather data regarding the event. Learning takes place by immediate, direct, involvement on the part of the learner in the actual learning event. Learners who prefer concrete experience are openly involved in learning situations in a direct, unbiased manner.

The second phase is reflective observation (RO) upon relevant phenomena derived from the situation. The learner mentally associates the data that have been gathered by the senses. As associations are made, the learner is in effect thinking about the relationships among the various observations which have been made. This phase of learning can occur in the actual situation or apart from it. It is possible to reflect upon perceptual events from many points of view. Outcomes of reflective observation depend upon the mental facility of the individual learner as well as the number of previous experiences which the learner is able to associate with the current learning event. Learners who prefer reflective observation choose observing and reflecting upon experiences from a variety of perspectives, in a divergent manner.

The third phase is abstract conceptualization (AC) about the meaning of what has been observed. The learner derives hypotheses regarding the nature of observations which have been made. Explanations are generated for relationships among the various observations which have been identified. Learners who prefer abstract conceptualization create concepts that combine observations to provide logical plausible explanations about relevant phenomena which they have observed.

Finally, in the fourth phase of active experimentation (AE) the learner tests out hypotheses which have been generated as explanations for the relationships among observed phenomena. Learners who prefer this mode use existing explanations and theories to solve problems in reality based learning situations. These learners prefer to be actively involved with the learning situation again. Thus, the model describes the cycle as beginning and ending with a specific concrete situation.

The experiential learning cycle suggests two primary dimensions of the learning process. Concrete experience is the polar opposite of abstract conceptualization; reflective observation is the opposite of active experimentation or hypothesis testing. Ideally, the learner should be affectively oriented toward using all four modes of the experiential learning cycle. However, the methods an individual consistently chooses to accomplish particular learning tasks indicate that distinct preferences exist for using specific modes.

Instruments

Kolb suggests that the degree to which a person favors particular stages of the cycle indicates the learning style preferences of that person. He developed the Learning Style Inventory (LSI) to assess preferences for these four modes of learning. The four subscales CE, RO, AC, and AE constitute the instrument.

Kolb's LSI (1978) uses a forced-choice ranking technique to determine a respondent's preference for a particular learning style subscale. It is a self-administered questionnaire that incorporates the scale and distractor words into nine items or sets of words. Scores for the four learning style subscales are obtained by summing the ranks assigned each of the six words that comprise the particular scales. Ranks assigned distractor words are ignored.

Correlations between words that comprised the four learning style subscales and total scale scores ranged between .46 and .67 (Kolb, 1978). Additionally, words comprising a scale correlated negatively with the theoretically opposite scale. Kolb concluded that the four subscale scores demonstrated convergent and discriminant validity. Odd-even split-half reliability coefficients (Kolb, 1978) for the four individual subscale scores were reported as ranging from .37 to .81 for five groups of respondents from which data were obtained (N=687). Test-retest reliability correlations for four groups of respondents ranged between .33 to .73 (N=110).

Evaluation tools for course objectives were developed in order to obtain measures of student achievement in the following areas: 1) knowledge, recall, and comprehension of cognitive material (quizzes); 2) ability to analyze clinical situations and apply principles of the nursing process (clinical process papers). These areas are defined according to Bloom's taxonomy as measuring different levels of objectives. Quizzes are at the level of knowledge, recall, and comprehension; clinical process papers are at the analysis and application level. Leveling of objectives according to these areas is consistent with learning theory as defined in Gagne's (1977) model.

The two quizzes developed for this course were each composed of 100 items evaluating knowledge, recall, and comprehension of facts, associations, principles, and general definitions of terms. Alpha reliability coefficients for quizzes ranged between .70 and .83 when previously administered to four different groups of baccalaureate nursing students (N=319).

Clinical process papers were constructed to test for analysis, and application of knowledge in simulated clinical situations using the four components of the nursing process (assessment, planning, intervention, and evaluation). Situations were constructed to simulate state board examination questions as far as possible. Alpha reliability coeffients for these instruments ranged between .65 and .78 when previously administered to the same four different groups of baccalaureate students (N=319).

Method

A quasi experimental within-subjects factorial design was employed with a descriptive survey technique. The relationships between learning style preference and achievement on outcome measures (quizzes (2), and clinical process papers (2)) were determined.

The sample consisted of 145 basic baccalaureate nursing students enrolled over two semesters in a theory/practicum course of the junior year in an integrated curriculum. A total of 133 (91.72%) agreed to participate by completing the LSI on the first day of the course. Scoring procedures used were those described by Kolb (1978).

Clinical process paper scores (CPP1 and CPP2) were collected as scheduled throughout the two semesters in which the course was taught. Quizzes were administered prior to the first clinical process paper at midterm and prior to the second clinical process paper at the end of the semester. Data were processed using the Statistical Package for the Social Sciences (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975).

Results

Table 1 shows correlation coefficients for the subscales of the LSI instrument.

Table 1. Correlation Coefficients for LSI Subscales

LSI Subscales	CE	RO	AC	AE
CE	1.00	-.01	-.59	-.04
RO	-.02	1.00	-.25	-.51
AC	-.59	-.25	1.00	-.18
AE	.05	-.51	-.18	1.00

Results of reliability procedures indicate that the subscales measure the two primary dimensions of the learning cycle as described by Kolb. Abstract conceptualization (AC) correlates negatively with concrete experience (CE); reflective observation (RO) correlates negatively with active experimentation (AE). These findings are consistent with those reported by Kolb (1978).

Table 2. Mean Scores@ and Ranges for LSI Subscales

LSI Subscale	Scale Mean	Range
CE	16.74	9-24
RO	*13.68	6-22
AC	15.74	8-24
AE	15.54	7-21

@The higher the mean score the greater the preference for a learning style score *$p<.05$

Table 5. Reliability coefficients for LSI subscales and Outcome Measures

Outcome Measures	CE	RO	AC	AE
Q1	.06	-.32	.26	.07
Q2	-.42	-.56	.49	-.01
CPP1	-.06	-.36	.64	.09
CPP2	-.01	-.58	.38	.06

Results of reliability procedures indicate a negative correlation on all outcome measures for subscale RO; a positive correlation is indicated on all outcome measures for subscale AC.

Discussion

The findings of this study do indicate that differences in learning style preferences can be demonstrated. The LSI instrument seems to measure two primary dimensions in the learning cycle. In this pilot study there were significant differences on the subscale RO. These nursing students scored lower, overall, on the RO subscale. If this scale measures discrimination learning, as Kolb suggests, a low score on the RO dimension indicates less preference for discrimination learning than for association learning, concept learning, and problem solving. Discrimination learning is of great importance in nursing education and practice. Nurses are constantly faced with distinguishing one class of conditions from another by learning and using a system of signs and symptoms. Nursing intervention is also based on the assessment of patients (CE) which involves the process of discriminating normal or expected conditions from abnormal ones (RO) in the formulation of a nursing diagnosis (AE).

Negative correlations for subscale RO on all outcome measures suggest that students need help discriminating among similar cognitive associations. Discrimination learning is difficult when materials are similar; the instructors task is to reduce similarity between associations. This can be accomplished by

Results of ANOVA procedures indicated that the mean preference score for the reflective observation subscale was significantly different from the preferences expressed by these students on the other three subscales.

Table 3 shows mean scores and ranges for outcome measures in the course.

Table 3. Mean Scores and Ranges for Outcome Measures

Outcome Measure		Mean Scores	Ranges
Quiz 1	(Q1)	88.55	66-99
Quiz 2	(Q2)	85.88	58-99
Clinical PP	(CPP1)	82.41	65-94
Clinical PP	(CPP2)	75.93	60-92

Table 4 shows results of ANOVA procedures for outcome measures and subscales of the LSI. Subscales were treated as independent variables and outcome measures as dependent variables.

Table 4. Pairwise Comparisons for Mean Outcome Scores and LSI Subscale Scores

LSI Subscale	Outcome Measures Ordered by Size of Means				
		Q1	Q2	CPP1	CPP2
	Mean	88.55	85.88	82.41	75.93
CE		*2.69	*2.76	.87	.86
RO		.63	.26	*2.72	.64
AC		*3.58	2.49	2.43	1.26
AE		.76	.74	.61	*2.70

---

*p<.05 F ratio ≥ 2.68

Results of ANOVA procedures indicate that mean preference scores for subscale CE differ significantly on Quiz measures; mean preference scores for subscale RO differ significantly on the first clinical process paper measure; mean preference scores for subscale AC differ significantly on Quiz 1, AC mean preference scores approach significance on all other mesures (p>.10-.20); mean preference scores differ significantly for subscale AE on the second clinical process paper measure.

Table 5 shows reliability coefficients for subscales and outcome measures.

focusing on differences, reducing interference by making stimuli more distinctive and by providing "coding links" (EX. same for sensory-afferent; motor-efferent) using repetition to overcome forgetting, and providing positive reinforcement for correct response.

Positive correlations for subscale AC on all outcome measures suggest that students who are able to hypothesize the interrelationships among variables in an explanatory manner do better, overall, on these measures of achievement. Anderson (1966) states that "for cognitive theorists, information is the key to concept formation: information is available from stimuli in varying amounts (CE), information is (discriminated) and assimilated (RO), and information is processed with strategies that are more or less parsimonious and efficient (AC)."

Concepts are inferred mental processes and the learning of a concept requires discrimination of stimulus objects (RO) in order to distinguish "positive" and "negative" instances of the concept (AC). This is an inductive (part to whole) process in which the learner is able to place an object into a class. The learning of conjunctive, disjunctive, and relational concepts greatly enhances the students ability to analyze and apply information in the clinical setting.

Prerequisite to concept learning (AC) the learner must possess the capabilities of acquiring information (CE) and making multiple discriminations (RO). This research suggests that students who prefer abstract conceptualization as a mode of learning do well on all measures of achievement. The RO dimension is not enough. If students stop short of the abstraction of concepts from their learning experiences they tend to not do as well. High scores on the RO dimension indicate a preference for a mode which is not as well suited to the needs of students in an integrated curriculum which emphasizes conceptual learning.

Based upon the patterns of preferences expressed by the learners who participated in this research, the following propositions are stated.

1. Students who score lower on the RO subscale than on the other subscales are significantly different from students who score higher.
2. High scores on the RO subscale indicate a preference for stopping the learning cycle at a stage prerequisite to concept learning. These students may require instructor guidance in developing abstract conceptualization learning skills.
3. High scores on the AC subscale indicates a preference for a mode in the learning cycle which is related to greater overall achievement on the measures in an integrated nursing curriculum.

These findings suggest that faculty need to give consideration to learning style assessment in order to identify learners who may have difficulty achieving the transformations in the learning process required to analyze and apply nursing concepts in the clinical setting. Instructional methods and individualized learning experiences which facilitate student achievement in integrated nursing curricula can then be developed. In addition, it may be possible to develop predictive models of success and/or failure in both integrated nursing curricula and on the licensing examination.

References

Anderson, R.C. Introduction. In R. C. Anderson & D. P. Ausubel (eds.) Readings in the Psychology of Cognition. New York: Holt, Rinehart, & Winston, Inc., 1966, 395-405.

Gagne, R. M. The conditions of learning. New York: Holt, Rinehart & Winston, 1977.

Kirby, P. Cognitive style, learning style, and skill transfer. Columbus, Ohio: The National Center for Research in Vocational Education, Ohio State University, 1979.

Kolb, D. A. Learning style inventory: technical manual. Boston: McBer & Co., 1976.

Kolb, D. A. Learning style inventory: technical manual (Rev. ed.) Boston: William McBee, 1978.

Nie, N. H., Hull, C. H., Jenkins, J. G., Steinbrenner, K., & Bent. D. H. Statistical package for the social sciences (2nd ed.). New York: McGraw-Hill, 1975.

Torres, G. Educational trends and the integrated curriculum approach in nursing. National league for Nursing Publication. 15-1522: 2, 1974.

CULTURAL DIVERSITY IN HIGHER EDUCATION: A CRITICAL CONTINUING ISSUE

by

Tomas Arciniega

California State College, Bakersfield

BIOGRAPHY - Tomas A. Arciniega

Tomas A. Arciniega, President of California State College, Bakersfield since 1983, is highly recognized in the area of cultural diversity in higher education. He has held a variety of positions, including most recently, Vice President for Academic Affairs, California State University, Fresno (1973-80), Principal Investigator of Southwestern School Study Project (1972-73); Assistant Dean of the Graduate School, Assistant to the President for Minority Affairs, and Associate Professor of the Department of Educational Administration & Supervision at the University of Texas at El Paso.

Dr. Arciniega earned his B.S. degree in Teacher Education at New Mexico State University; his M.A. and Ph.D. in Educational Administration from the University of New Mexico. He has authored or coauthored many publications in the educational field.

In 1978 Dr. Arciniega was selected one of the top 100 Academic Leaders in American Higher Education by Change magazine. Currently, Dr. Arciniega is a member of the editorial board of Educational Researcher; The Journal of Instructional Psychology; Journal of Educational Equity and Leadership; and The Urban Review.

Cultural Diversity in Higher Education:
A Critical Continuing Issue

by

Tomas A. Arciniega

I am very pleased and honored to have been invited to be one of the theme speakers for the Second Regional Conference on University Teaching. The theme of your conference is certainly a very important and timely one and I commend all of the organizers for a superb effort. The program you have pulled together is indeed impressive.

Focusing on what is involved in improving university teaching at any time is important for many reasons which any number in this room could wax eloquently about for hours I'm sure. It is especially relevant, however, at this time because higher education is entering a period of public questioning---where not just our budgets but the very base purposes and the quality of our enterprise is undergoing critical public examination.

The public spotlight of educational reform which has been focused on public schools has now begun to turn toward colleges and universities. Though we may feel uncomfortable about it and be prone to resist it, there is little we can do to avoid it. However, there is a great deal we can do, in my opinion, about seizing this as an opportunity to re-examine ourselves and in the process enlist public support for some needed reform initiatives on our campuses.

Which brings me to the fundamental problem which brought us together this afternoon and is the reason cultural diversity issues rightfully should concern us in conferences such as this and more importantly in our daily academic lives----mainly the problem of the underrepresentation of Blacks, Hispanics, and American Indians on school, college, and university campuses of America. This is a serious and complex problem which, as far as finding solutions, we really haven't made all that much progress on. It is a problem, I would hasten to underscore, which, given the demographics, has major national implications that go beyond simplistic notions about the importance of this concern only because people of color need a helping hand.

It seems to me that in any discussion of the problem of minority underrepresentation in higher education there are two undergirding elements or issues which we should make clear and explicit. The first involves the relationship between education and power. And the second has to do with that not so popular concept these days of social justice and how that concept seems to play out in the current much publicized concern for quality in education.

As regards the first of these, I am absolutely convinced of the direct link between power and education for minorities. For Blacks and Hispanics, especially, education is the surest route to permanent empowerment. And because education provides the means by which minority people can move their lives from bondage toward meaningful freedom, I believe that to deny minority people an education is immoral and criminal.

Moral imperatives aside, the issue is broader and an even more pressing national one having to do with the importance of investing in people. There can be no wiser investment than that we make in the development of our human infrastructure, as the economists would say, or more simply put, the investment we make to insure a fair shake for people as regards decent housing, their education, and their health.

Therefore, it is not just a matter of social justice, but of national necessity. In some ways that has always been the case, but is a more serious concern for America today. On the one hand, because of the shifting international power and world economic situation we face. On the other, because the changing nature of our population demands that our education system be more effective than ever before. It is becoming increasingly apparent we ignore that fundamental fact of modern life at great risk.

The cruciality of that point and the dramatic importance of viewing education as perhaps the wisest of investments is best brought home by the changing demographic picture in this country. The structure of American society has undergone some very significant changes which could have great potential for serious societal conflict. Let me cite a few relevant statistics to underscore the significance of this current reality.

In the decade from 1970-1980, demographic growth among minority groups in the U. S. was more rapid than in the population as a whole. Hispanics, for example, increased 60 percent from 9.1 to 14.6 million (some estimates run as high as 16 million). In states such as Florida, Texas, and, of course, California, this trend was even more pronounced. American Indians and Asian and Pacific Islanders more than doubled;

Hispanics grew by 92 percent; Blacks by 30 percent.

Taking the case of California, in absolute numbers, the 4.5 million Hispanics living there represent the largest minority group in that state--at about 1/5 of the total population. Chicanos are the largest sub-group among Hispanics both nationwide (60 percent) and in California (82 percent). The median age of Hispanics is a little over 22 (nine years younger than the total population) which results in a large school and college age cohort.

Importantly, as we look to the near future, the projected growth of the Hispanic population will account for a substantial share of the total national growth in population between 1980 and 2000. Persons of Hispanic origin are projected to account for over fifty percent (some demographers insist it will be closer to sixty percent) of the growth in the key southwest region and Florida between now and the year 2000. Comparing the relative growth of Hispanics and the general population, the projections are that the Hispanic population will grow 97 percent while the total population is expected to grow by only a little over 30 percent during that period.

Another demographic problem, which in many ways is even more challenging, involves the aging of America. Alan Pifer, the immediate past president of the Carnegie Corporation, who has been heading a national study on aging, summarizes the problem this way:

> "As the consequences of increases in the fertility rate over the three decades from the early 1930's to the early 1960's, the number of births rose from a depression low of 2.3 million in 1933 to a high of 4.3 million in 1957, bringing into being the baby-boom generation. The baby-boom generation is a demographic

> phenomenon of major proportions whose chronological progression through successive decades has been likened to the passage of a tennis ball through the belly of a snake. Its impact on education, societal values, the job market, political attitudes, and in other realms is already enormous and will continue to be well into the next century.
>
> Similarly, the precipitous decline in the fertility rate from 3.7 in 1957 to 1.8 today, well below the replacement rate of the population, has produced yet another demographic phenomenon, the baby-bust generation. Seven million fewer young people will reach working age in the 1990's than did so in the 1970's. This aberration will pose serious problems to the not-too-distant future in the form of a shortage of entry-level workers for the economy and, possibly, depending on the needs at that time, of young men and women for the armed forces. Over the greater run, as the number of older, no-longer productive people in the nation mounts, and especially after about the year 2010 when the members of the baby-boom generation will begin to retire in large numbers, the proportion of active workers paying for the benefits of retired persons--in 1950 about 16 to 1 and presently about 3 to 1--will be only 2 to 1 (if present fertility trends continue)."

The significance of these demographic phenomena for our concerns lies in the built-in conflict between the so-called baby-boom and baby-bust generations and the large increase in numbers of the elderly. The challenge for the nation revolves around the issue of how to maximize or make the most of the more limited number of productive workers we will have in relation to non-working Americans, particularly elderly Americans.

We just have to do a better job of educating and preparing our people for the heavy responsibilities which face them in the decades ahead. At first blush it seems an almost irresolvable problem; with resources so severely limited and given the seemingly impossible to deny demand and political clout of the elderly which results in greater and greater amounts spent on them, how do we take care of the investment in education costs which is required to maximize work force output? It is a very difficult problem especially in light of the fact that it will mean investing disproportionately in the education of increasing percentages of ethnic minorities since that's where growth is occurring and in the face of a public backlash from some segments of our communities.

Nevertheless, it seems to me that whatever the difficulties and no matter how serious, we simply have no choice as a nation but to invest first and more generously on that smaller number of Americans now being born and for which a university education is especially key. Investment in the human resources of this nation has always been important, but it has become many, many times more so because today's students and those who follow in the next ten to fifteen years will be the most heavily burdened generations ever in the nation's history.

Returning to the second of the two initial overarching issues I noted at the outset, mainly the concern we should have about social justice and how these things are playing out in these days of highly publicized concern for quality in education, Bernard Harleston, the President of the City College of New York, cuts to the heart of the social justice issue:

> "Opportunity is being replaced as a term in the public debate on access to education by 'academic excellence.' The claim of a growing chorus is that we need to demand more of our students, we need to improve their performance on standardized tests, we need to revamp the educational system so that we produce a population of high achievers. But the undercurrent in the debate is that we need to limit access to educational institutions. When all the euphemisms are eliminated and the jargon peeled away, the case of the argument advanced by the critics is that access should be limited to those students who are destined to be successes in the academic world."

> "But what of those who by virtue of the circumstances of their birth or their early exposure, the color of their skin or their Spanish surname, are destined, without access to education, to be excluded from the job market, the housing market, the marketplace of life? Should not all who want higher education have that opportunity, not just those whom circumstances permitted to go to the best primary and secondary schools under the best circumstances?"
>
> "Look at the facts and begin at the beginning. What does it mean that forty and fifty percent of the kids in our urban high schools drop out, and what of the even higher cumulative dropout rate of minority teenagers? We must talk first about and act first on the issue of how we keep these young people in school. Then we can talk and act on how we upgrade and insure the quality of their educational experiences. This is the reality of the present crisis in america's education. If we do not confront directly, openly, and with compassion the realities of the dropout phenomenon, our collective concern about 'quality' will amount to a functional hill of beans--and will lack integrity and moral persuasion."

Irving Spitzberg puts the matter even more directly:

> "It is imperative that every discussion of quality acknowledge and reject any cost in terms of opportunity and that standards be constrained by an equally strong commitment to equity. It will not be good enough to invoke quality if we forget equity. Nor will we create equality of opportunity if our strategies for equity are at the expense of the quality of the opportunity. We will achieve neither equity nor quality if we do not give careful attention to our policy goals and to the strategies for implementing change consistent with these goals."

For me, the access dimensions of the issue boil down to the simple matter of what's right and of recognizing the importance of education for minorities during these times. It is a question of fairness and integrity as well as equity. I decry the indisputable fact that Blacks, Hispanics and American Indians comprise a disproportionately higher percentage of those victimized by the recent cuts in federal financial aid for college-age needy students. I am very concerned about the decrease we've experienced in minority college enrollments across the country during the past four years.

The fact is that the status of Hispanics, American Indians, and Blacks at the post-secondary level today is indeed bleak. Until the late 1960's, the participation of Hispanics at the college level was almost negligible. The same was true of Blacks and for American Indians it was worse. However, improvement in the participation rates of Hispanics and other minorities did occur in the late 60's and early 70's, paralleling the civil rights era and equal opportunity efforts at the K-12 level. But those improvements were short-lived for as the mid 80's reality shows us only too clearly the national college-going rate of Hispanics and Blacks leveled off, and overall has even begun to decline since 1976.

In California about 60 percent of all high school graduates enter some form of postsecondary education. Estimates based on 1982 enrollment data indicate that 80 percent of Hispanics who attend public postsecondary institutions in California enrolled in two-year community colleges, as did 83 percent of Blacks. In contrast, only 42 percent of Asians and 19 percent of Whites who attended public higher education selected community colleges.

However, it is true that a number of excellent voluntary "experimental" campus programs to overcome educational disadvantage were initiated during the mid-1960's. Although the impact of these EOP and similar programs was evidenced between 1969 and 1978 with some increases in the participation of Hispanics and other minorities, progress has since diminished.

Singling out the case of Hispanics, two things are important to note. First, some of those recent decreases in the proportion of Mexican-American students in particular are even more pronounced than has been publicized since they have been masked by increases in the enrollment of those classified as "other" Hispanics. And as we're all aware, any apparent increase in the number or even the percentage of Hispanic undergraduates attending higher education institutions is attenuated by the major increases in Hispanics among high school graduates. The point which these data drive home is that it is obvious that existing programs are not adequate to progress beyond the current plateau. New initiatives are needed to increase the number of Hispanics, American Indians, and Blacks who are prepared for university study and to ensure that they receive the assistance necessary to enroll and remain in college. Although underrepresentation is a problem for a number of minority ethnic groups, the situation is particularly critical for Hispanics and Blacks given their increasing numbers and their overall record of low educational attainment.

This is a very serious matter when one considers the implications of these demographic trends; when we consider, for example, that shortly after the year 2000, minorities will become the majority in California with others moving in that direction. California will be the first mainland state to become a majority minority state and Hispanics will be the largest by far of the minority population groups.

It is for all of those reasons that I have so little patience with the argument that a "recovery of quality" in higher education--which I fully support--must somehow mean that we turn away all initially underprepared students. I find the invocations of quality which lead operationally to a denial of equity for minorities to be totally unacceptable.

The brief overview of the postsecondary educational experiences of minorities which I've given underscores the need for concerted attention at this time. The disparity between the proportion of minorities who enroll in higher education and their representation among high school graduates and persons of traditional college-going age is far too great.

These harsh statistical realities frame the general parameters of our underrepresentation problem and lend urgency to the call for reform of the status quo. The circumstances beg two obvious questions. What should we do about it? And, importantly, won't all these recent efforts to raise admission requirements and the tightening of college prep curricula in high school exacerbate the problem of Black and Hispanic underrepresentation in public higher education?

In response to the latter question, unfortunately the answer is yes---unless we can effect major changes in the public secondary schools which will increase dramatically the number of Hispanics and Blacks taking college preparatory courses. Specifically, this means expanding the curricular offerings in high minority enrollment high schools and intermediate schools and revamping the guidance and counseling systems to insure a bigger stream of minorities moving into and across to the "college prep" tracks in those schools.

That is what we are attempting in our system. Our Trustees last Fall increased the admission requirements rather dramatically. Beginning in 1988 we will require a full college preparatory pattern of high school coursework to include four years of English, three years of math, two years of foreign language, one year of science, and one semester of performing arts. And students must continue to place in the upper third of their high school graduating cohort determined by scores on the SAT, or ACT, and their GPA.

As regards the first question--what do we need to do--I think the direction we need to move in is fairly obvious. Although this is not the place to try and give a full listing of all we need to do, let me give a brief outline of the kinds of things I believe are absolutely critical if we're to make a difference.

Obviously, we need to significantly increase our outreach efforts but do so in very targeted ways. Our institutions of higher education must commit themselves to work on a faculty to faculty basis with the high schools in science, math, and English especially. The curricula must be articulated to insure that high school students are being prepared in a manner which enables them to meet the expectations of the general education requirements once admitted to the university. Both faculties should be working closely and collaboratively on the design and fashioning of the placement tests required say in math and English again to insure a congruence in the expectations we lay on our students from both ends.

Secondly, the university needs to organize a comprehensive series of activities aimed at informing minority students and their families of all that is requried to go to college. Of particular importance, in this regard, is the need to provide carefully prepared and accurate information on financial aid possibilities and options. The university has to work through and with community group leaders, networks, and parents to reach the minority communities. Nothing is more important and essential than this, if we're serious about telegraphing the university's interest in enrolling minority students.

Thirdly, summer bridge and in-school bridge programs need to be mounted in collaboration with the surrounding school districts for the announced purpose of increasing the number of minority students on campus. This should start with a massive SAT or ACT testing effort made available to all minority students free of charge the results of which are to be used to organize special support activities aimed at helping the maximum number of students qualify for college admission to the program of their choice. Sub-scores as well as overall scores should be used to screen in the most students possible.

Summer bridge efforts should key and flow from those results and should target on the students who need immediate help and who have a chance with basic skills help to become college eligible. The summer bridge programs should include at minimum senior and junior level students and the coursework they take should be heavily basic skills oriented.

In-school bridging efforts need to likewise target on those students closest to the mark. For example, a regularly scheduled class period in the high school curriculum where minority students could receive direct tutoring help in math, science, and English is essential. Ideally the teacher assigned would be assisted by a team of role model college-student tutors and/or peer tutors.

This would occur as part of the student's regular day and courseload. College information and career option information activities should also be programmed along with multiple visits to the university campus as part of the program.

It is important to organize these kinds of activities at the intermediate as well as the high school level. Students are tracked very early these days and unless special efforts are made to counter the usual trends the inevitable result will be that minorities end up in non-college preparatory courses.

Thirdly, the university needs to become involved directly in charting on a year-to-year basis what the rate of minority participation in college prep coursework is by school and school district. They need to collect and provide that information to the respective principals and superintendents along with graduation and dropout statistics on their students. The profile for each school should delineate the pattern of courses students in college are taking, how students from each school are doing in college, and what their drop-out rate is at the university level. Of particular concern to us in California is to use this data as a means to initiate a needed dialogue among our universities, community colleges, and high schools about the pattern of courses minority students are taking and how these compare across schools. As part of this we have worked to tie our computing system to the school districts so we can call up transcript information directly on our computing system.

Fourthly, a concerted effort needs to be mounted to involve faculty and staff in making high school visitations and in special money raising activities for minority scholarships. These may run the gamut from working with specific ethnic community groups to involving individual donors and service clubs. What is important about this is both the type of commitment it generates to this need, on the part of university people, as well as the message we telegraph to our community about our commitment to increasing the participation of minority students in higher education.

A fifth area of concern is more directly tied to what needs to be done on campus. First and foremost on the campus it is important to insure that all know that this thrust is a top priority concern for the institution and its leaders and to organize accordingly. Once this is established it is a relatively simple matter to organize an early warning system to provide minority students encountering difficulties with special assistance at the mid-quarter point. That help can take various forms from tutoring help to discussions with the professor or even personal counseling. The key is having a professional person charged with the responsibility for contacting the students, evaluating the problem and following up. It is essential that we concern ourselves not just with admitting minorities to our hallowed halls but insuring their continuation and graduation.

A learning assistance center or unit charged with the responsibility for coordinating targeted student support activities is also important. Tutoring, financial aid counseling, small group study skills seminars, peer counseling assistance, cultural group reinforcement sessions, and individualized computer assisted career guidance activities are good examples of the array of support activities which are needed.

These efforts, however, should not be confined to the student affairs side of the academic house. The academic affairs area needs to also play at least as major a role in effecting the changes needed. Certainly the university should support its ethnic studies program or department and commit adequate resources to insure the viability and stature of that program. However, the commitment of the institution needs to go beyond that if we're going to be successful in improving the participation rate of minorities in higher education and equally as important if we're going to afford all our students a more culturally pluralistic university education.

Our general education offerings--those courses we require of all students regardless of major--should include ethnic studies and multiculturally oriented courses. This is important for several reasons. The most important reason being that it makes a clear statement about the institution's interest and responsiveness to such concerns. It communicates to our students, to our faculty and staff, and to our various publics that we recognize the individuality and importance of our various ethnic groups and their distinct traditions and values. That we understand that knowledge about ethnicity aids all our students in the development of their understanding and sensitivity toward ethnic groups and their heritages. And that all of these understandings are of vital importance to the leaders of the next American decades.

Ideally, too, the infusion of culturally pluralistic content and concepts needs to cut across all the base disciplines especially the social and behavioral sciences. Probably the best way to insure this is by insuring that our statement of institutional mission commits us to doing that and, finally and most importantly, by recruiting the right faculty. If an institution recruits people who nave the background, expertise, and commitment to such culturally pluralistic ideals, it will have taken a major step in the right direction.

All the preceding to reaffirm the importance of taking a firm and unequivocal institutional stand in support of culturally pluralistic ideals with that affirmation needing to be reflected in the form and content of all institutional activities. It is essential that our programs demonstrate that we value cultural pluralism; that we recognize cultural diversity as an important fact of life in American society and insist that this cultural diversity is a valuable national human resource which should be preserved and extended; and that this institutional commitment put us on record as rejecting the view that our schools and colleges should seek to melt away cultural differences or the view that we should merely tolerate cultural pluralism. Instead, everything we do needs to communicate clearly our belief that all our institutional efforts must be oriented toward the cultural enrichment of our students through programs rooted to the preservation and extension of cultural alternatives.

The American Association of Colleges for Teacher Education some years ago in their classic statement known as the "No One Model American" essay captured well the value and importance of cultural diversity in America. Their elegant and clear message states in part:

> "To endorse cultural pluralism is to endorse the principle that there is no one model American. To endorse cultural pluralism is to understand and

> appreciate the differences that exist among the nation's citizens...cultural pluralism is more than a temporary accommodation to placate racial and ethnic minorities. It is a concept that aims toward a heightened sense of being and of wholeness of the entire society based on the unique strengths of each of its parts.
>
> ....To accept cultural pluralism is to recognize that no group lives in a vacuum--that each group exists as part of an interrelated whole."

How to remain true to that imperative is the challenge before us as a profession and in the larger sense as a nation. I'm optimistic that we can and will accept that challenge and urge each of you to close ranks in pushing for what has to be done to complete that unfinished human rights agenda.

Gracias

References

1. The Tomas Rivera Center Publication, *The Changing Profile of Mexican America: A Sourcebook for Policy Making*, October, 1985.

2. Arciniega, Tomas A. and Morey, Ann I. (eds.), *Hispanics and Higher Education: A CSU Imperative: Final Report of the Commission on Hispanic Underrepresentation*, California State University Publication, June 1985.

3. Pifer, Alan, Speech to the Child Welfare League of America, "Children - A National Resource," Boston, Massachusetts, October 29, 1982.

4. Harleston, Bernard W., Keynote Address to the Honors Convocation City College, New York, May 17, 1984 and see also Harleston, Bernard W., "Higher Education on the Firing Line: The Challenge to Educational Leaders," Address to the National Association of College Admissions Counselors in Boston, Massachusetts, October 1, 1984, quoted by John D. Maguire in "Searching: When Old Dreams Find Their Youth Again," AAHE Bulletin, May 1985.

5. Spitzberg, Irving, Informal Discussion Paper for the 71st Annual Meeting of the Association of American Colleges, December 27, 1984.

6. American Association of Colleges for Teacher Education Multicultural Statement, "No One Model American," adopted by AACTE, November, 1972.

MEXICAN AMERICAN FACULTY IN THE SOUTHWEST: SOME SURVEY RESULTS

by

Adalberto Aguirre, Jr.

University of California

According to a report prepared by the Western Interstate Commission for Higher Education (1980), Mexican Americans are the most underepresented minority group in postsecondary educational institutions in the Southwest eventhough they are the largest minority group in the Southwest. For example, compared with white persons in the 18-24 age group, (48%) of the Mexican American population, versus (81%) of the white population, is enrolled in postsecondary educational institutions. A serious outcome of limited Mexican American participation in postsecondary educational institutions is that it restricts the number of potential Mexican American candidates for positions at postsecondary educational institutions. For instance, the fact that Mexican Americans comprise less than 2% of the undergraduate enrollment and less than 1% of the graduate enrollment implies that only a very small number of candidates may be available to fill academic faculty positions (Escobedo,1980;Lucas,1981;Astin & McNamara,1982).

Mexican American Faculty

Almost a decade ago, Arce (1976) estimated the number of Mexican American faculty at less than 1% of the total full-time faculty population. A more recent report from the California Postsecondary Education Commission (1981), estimates that Mexican American faculty account for 1.1% of the total full-time faculty in the United States. According to the report, Mexican American faculty account for 0.1% of full professors, 0.3% of associate professors, and 0.7% of assistant professors. What is striking about these estimates, on the one hand, is that the number of Mexican American faculty has not increased much since Arce's estimate despite the fact that this was at a time when the number of Mexican American Ph.D.'s was at a peak. On the other hand, these estimates clearly show the high concentration of Mexican American faculty at the junior level.

My purpose in this paper is to present some data that focuses on the individual and institutional features of Mexican American faculty in the Southwest. My intent is to describe the population of Mexican American faculty in the Southwest. The lack of information that presently exists regarding Mexican American faculty seriously hampers any comparative format one may develop. Secondly, the problem in identifying Mexican American faculty limits the degree of representation. Given these limitations, I hope to produce a portrait of Mexican American faculty that will illuminate their presence in academe.

The Survey

During 1980-1981, I conducted a survey of Mexican American faculty at postsecondary educational institutions in the Southwest (Arizona, California, Colorado, New Mexico, Texas). The sample was derived from the National List of Chicano Contacts In Higher Education. This list is updated annually in order to maintain a high degree of representation.

A total of 322 questionnaires were mailed to individuals with doctoral degrees teaching at bacculeaureate granting institutions. A total of 182 questionnaires were returned, but only 159 were used in the analysis because they met the following conditions: (a) the respondent occupied a tenure earning position, and (b) the respondent identified his background as Mexican American or Chicano. The overall response rate for the sample was 48%, and the response rate by state was: Arizona (51%), California (39%), Colorado (61%), New Mexico (59%), Texas (51%).

Regarding their academic rank, respondents in this study reported as follows: assistant professors (56%), associate professors (25%), and full professors (19%). The majority of respondents (86%) received their doctoral degrees in the Humanities, Social Sciences, or Education, with the remainder (14%) receiving their doctoral degree in the Natural & Agricultural Sciences. The large concentration of respondents in the Humanities, Social Sciences, and Education does not differ from the general pattern for the distribution of Mexican American students at the graduate school level (National Science Foundation,1981;Atelsek & Gomberg,1981).

Some of the more salient features of the respondents are: (a) 82% are male and 18% are female; (b) the median age is 37 years; (c) the majority (79%) were born in the Southwest, and over three-fourths of these reported receiving their doctoral degree at an institution in the Southwest; (d) 11% reported they held faculty positions at the institution where they received their doctoral degree; (e) 43% of the respondents reported that they held a faculty position at an institution in the state they were born in; and (f) those respondents with less than three years at their present institution, 89% reported that their previous academic appointment was at an institution in the Southwest.

The majority of respondents (79%) reported receiving their doctoral degree at a public institution. Of these, 82% reported that they held a faculty appointment at a public institution. Of those respondents that received their doctoral degree at a private institution (21%), 73% reported holding an academic appointment at a public institution.

Institutional Features

Respondents were asked to report their participation in minority-focused activities at their institutions. The majority of respondents (96%) reported participation in some type of minority-focused activity.

In particular, (a) 76% reported serving on university service committees specifically focused on minority issues, (b) 79% reported teaching classes focused on Mexican Americans, and (c) 88% reported participating in university activities focused on the recruitment and retention of Mexican American students.

The type of institution (public versus private) the respondent was located at was associated with the type of minority-focused activity he/she participated in:$X(2)=35.38$, d.f.=2, $p<.05$. Respondents at public institutions are much more likely to participate in university service activity focused in maintaining liaisons with the local minority community, whereas respondents at private institutions are much more likely to participate in student recruitment activities.

The respondent's academic rank was also found to be associated with the type of minority-focused activity:$X(2)=12.48$, $p<.05$. Comparatively speaking, junior faculty are much more likely to participate in activities focused on teaching classes and student recruitment, and senior faculty are more likely to serve on university service committees.

Finally, women reported less participation in minority-focused activities than men. For those women reporting participation in these activities, a greater proportion, when compared with men, reported teaching classes focused on Mexican Americans, and a lower proportion reported participating in student recruitment activities.

Discussion

At least two things are obvious about the findings reported in this paper: (1) Mexican American faculty appear to situate their educational and career patterns in the Southwest. While our data limit the degree of speculation one can engage in, one can suggest that their may be a latent educational pipeline in the Southwest (i.e. an "old boy" network) that reinforces and regenerates the educational presence of Mexican American graduate students and faculty. An examination of this suggestion could produce some information that would question the often offered commonsense notion that Mexican American students stay in the Southwest because they are afraid to pursue their educational interests elsewhere.

Secondly, it is clear that the majority of Mexican faculty participate in some type of minority-focused institutional activity. The fact that differences exist between types of institutions suggests that Mexican American are utilized in different roles by supposedly competing institutions. In addition, the fact that academic rank is associated with type of minority activity suggests that university service in minority activity is not the same for all participants.

References

Arce, C. (1976). "Chicanos in Higher Education." Integrated Education, 14:14-18.

Astin, H. and P. McNamara (1982). "Educational and Career Progress of Chicana and Native-American College Women," pp.205-227 in P. Perun (ed.), The Undergraduate Women: Issues in Educational Equity. Lexington, KY: Lexington Books.

Atelsek, F. and I. Gomberg (1981). Selected Characteristics of Full-Time Humanities Faculty. Higher Education Panel Report No.51. Washington,D.C.: American Council on Education.

California Postsecondary Education Commission (1981). Women and Minorities in California Public Postsecondary Education. Sacramento,CA: CPEC.

Escobedo, T. (1980). "Are Hispanic Women in Higher Education the Nonexistent Minority?" Educational Researcher, 9:7-12.

Lucas, I. (1981). "Bilingualism and Higher Education: An Overview." Ethnicity, 8:305-319.

National Science Foundation (1981). Young and Senior Science and Engineering Faculty,1980. Washington,D.C.: NSF.

Western Interstate Commission for Higher Education (1980). Representation of Minorities in Higher Education in the West: A Research Report. Denver, CO: WICHE.

THE COLLEGE CLASSROOM: CHANGING CLIMATES AND CULTURES

by

Len Ainsworth

Texas Tech University

THE COLLEGE CLASSROOM: CHANGING CLIMATES AND CULTURES

C. Len Ainsworth
Texas Tech University

The diversity among institutions of higher education in the United States is unmatched in any other nation in the world. This diversity is related to the responsiveness of higher education to the society in which it exists, and according to some, for its high level of performance. Not only does diversity exist among institutions but there are varieties of educational missions and goals within institutions. Accommodation of those diverse goals within multipurpose institutions is of particular concern.

The major purposes of contemporary higher education, such as those developed by the Carnegie Commission, for increased student development, human capability, educational justice, advancement of learning and evaluation of society enjoy rather universal support and approval at general levels.[1] When institutions attempt to define specific goals for programs, however, inconsistencies and contradictions appear.

At the individual college or division level there are environmental pressures in conflict. These pressures tend to act to reduce levels of diversity by demanding certain high levels of performance toward predetermined goals. At the same time there is recognition of pressure for serving the needs and orientations of the ever broadening society.

Population shifts, increases in community colleges and their enrollments, and changes in political environment - particularly at the state level - have strong potential impact for colleges and their classrooms. For example, the increase in population of Hispanic-Americans in the Southwest is at a rate that will affect society on a broad scale.

A logical expectation might be that even more broadly diverse programs would be developing, on a national scale. Flora Ortiz, for example, has noted that the United States has become a national society, and that problems of equity are not likely to be resolved at the local level.[2] There have been prestigious reports earlier (such as Newmans in 1971) which criticized decreasing diversity, insensitivity to minority students and women, depersonalization and high attrition rates. Several of those reports (e.g. Carnegie, Non-Traditional Study) were focused upon improved service to learners. There is, then, some national recognition of and concern for meeting the needs of culturally diverse students. These needs, however, sometimes seem to run head-on into intensified concern for improving academic quality. This may be complicated by competition for new students, partly as a means of institutional survival. Dr. Kenneth Mortimer, one of the authors of the 1984 National Institute of Education report, Involvement In Learning has stressed the value of greater access to higher education, and has noted that equity means access to quality programs.[3] In a recent lecture he emphasized also that "Quality can be attained in diverse educational contexts." While the diverse contexts Mortimer referred to may have been at the unit or institutional level, they are also needed at the program or classroom level. Most institutions, programs and classrooms now have students who reflect varied backgrounds. Many of those students are of minority backgrounds, with cultural and social histories different from their classmates.

While minorities seem to be underrepresented in total undergraduate enrollments and in many areas of study, minority students may be more likely to attend college than non-minority students of some level of academic achievements and socioeconomic status.[4] For Texas, recent data on enrollment and degree patterns show considerable underrepresentation for Hispanics and Blacks at all levels of post secondary education, and that the greatest population growth over the next twenty years will take place among these populations.[5]

The total numbers of minority students are increasing, however, and the concern for changing classroom climates is thereby intensified. The remainder of this paper focuses upon needs and approaches for faculty to be made aware of cultural differences in their classrooms, and of qualities and competences needed for effective teaching.

Critical issues revolve about developing instructional programs particularly suited to somewhat homogeneous groups within larger, more heterogeneous settings. The issues seem to have moved beyond just concern for equal educational opportunity or access to higher education to adequacy of educational attainment by those who have accomplished entry.

The groups, even though stereotyping is often unfair, seem to be identifiable, as are some of their needs. Foreign students, for example, may need development of classroom language skills. Sociocultural variables for groups of foreign students as well as of domestic students need recognition and further study by those in higher education. The culture and linguistic abilities of foreign teaching assistants is of significant concern. Some of those instructors, trained in other systems, seem to involve themselves less than native instructors in give and take communication with other students. The impact of those behaviors needs further study, and provides another dimension of multicultural educational needs. The relationships of the other cultured foreign students or teachers with our diverse domestic cultures is apparently an unresearched area.

There are many and more narrow elements which could be researched (and in some cases have been). These include differential treatment by instructors of women and minorities with regard to such things as eye contact, types of questions asked, and expected responses.[6] Socio cultural variables, such as fatalism, present orientation and familialism as related to Hispanic American culture, for example, need recognition and study by higher education faculty. The stereotypes and myths about Chicano students have aroused concern, particularly as relate to learning styles. García, and others, rightfully note that development of information on personal cognitive styles is also important.[7] Learning-style awareness could assist the students in relating their unique backgrounds to develop their learning process.

Development of understanding of cultural differences and their impact on behavior and learning styles has begun in a variety of ways in various institutions. For example, Eastern New Mexico University at Portales, in 1980 began a commitment to multicultural education in its teacher education program. The recognition of the pluralistic nature of the schools was important to establishing goals for meeting differences - not only in ability - but in the way in which students learn. The University has evidenced its commitment to goal attainment through an ongoing series of seminars, workshops and professional meetings related to integrating multicultural concepts into courses.[8]

College course planning must also take into account learner characteristics, course content, the process of delivery, and evaluation. The context and classroom climate in which instruction and learning takes place is undoubtedly important. Enhancement of the classroom climate and attention to cultural pluralism through recognition of learner differences, as well as in changing instructional patterns are substantial problems facing individual faculty members.

The "atmospheres" of institutions need to be accepting and supportive for students to work toward and achieve their potential. Supportive programs are frequently mentioned in the literature as being beneficial. Basic financial aid is also important to provide means for many to participate in higher education. The atmosphere for individual students may be affected by their concerns for funds for subsistence, much less for participation in the variety of activities which exist on the campuses.

Garcia and his co-authors have emphasized the need for minority role models among faculty and staff in higher education.[9] At the same time they note the lack of such individuals. They note the need for support services for Hispanic students to be provided by Hispanic staff. A study at the University of Wisconsin - Milwaukee also noted the limited role models for young black students to emulate.[10] Particular attention to instructional techniques needs to be developed even if role models do not provide the teaching. Flora Ortiz has stated, for example, that history may be taught more effectively - to Hispanic Americans - if Hispanic participation is included.[11]

There are a number of approaches to meeting the changing culture of the classroom. And we should remember that the climate is not entirely culture dependent. There is substantial concern that female students in many classrooms are treated differently than their male counterparts. These concerns apparently are not subject matter specific, that is, climate and cultural impact varies because of individual faculty behaviors rather than because of subject or course content.

Faculty members need to continue to pay attention to cultural differences in their classrooms. In addition, questions related to what constitutes effective teaching must be studied. Attention must be given to those qualities and competencies considered essential for effective teaching, which include such time honored elements as respect for human personality, understanding of social behaviors, understanding and skill in human relations. Sufficient general and specialized knowledge, and competence in goal setting and in evaluation must continue to be stressed.

The importance of classroom climate and the recognition of the multiple facets of cultural pluralism is yet at a stage in which awareness must be developed throughout higher education faculty. As faculty we might do well to recall an adage which suggests that many students "don't care how much you know until they know how much you care." Perhaps through care - and study - we can address cultural change and cultural differences in the classroom through improved and enlightened climate for learning.

References

1. Carnegie Commission on Higher Education. *The Purposes and the Performance of Higher Education in the United States*. New York: McGraw-Hill, 1973.
2. Ortiz, Flora, "Hispanic-American Education," *Encyclopedia of Educational Research*, 5th Ed., New York: The Free Press. 1982. 787-791.
3. Study Group on the Conditions of Excellence in American Higher Education, *Involvement in Learning: Realizing the Potential of American Higher Education*. Washington, D.C., National Institute of Education. 1984.
4. Birnbaum, Robert, "Higher Education," *Encyclopedia of Educational Research*, 5th Ed., New York: The Free Press, 1982, 779-787.
5. Dolman, Geoffery, Jr. and Kaufman, N. S., *Minorities in Higher Education: The Changing Southwest* (Texas). Boulder, Colorado: Western Interstate Commission for Higher Education, 1984.
6. Heller, Jack F., Puff, C.R. and Mills, Carol J., "Assessment of the Chilly Climate for Women," *Journal of Higher Education*, 56:4 (Jul/Aug 85) 419-45.
7. García, Hermán, et al, "Ethnic Minority Students, Admission Policies and Academic Support Programs in Institutions of Higher Education," *Texas Tech Journal of Education*, 11:1 (Winter 1984) 77-89.
8. Cox, Euola W., "Multicultural Teacher Education: A Model for Implementation," *Texas Tech Journal of Education*, 11:1 (Winter 1984) 55-65.
9. García, op. cit.
10. Spaights, Ernest, et al, "Racism in Higher Education," *College Student Journal*, 19:17-22 (Spr. 85) p. 17-22.
11. Ortiz, op. cit.

CULTURAL DIVERSITY: AN EXPECTATION FOR TEACHING

by

Narviar Cathcart Barker

Georgia State University

Culture happens when man is a member of society (Tylor, 1929). Society consists of organized groups. Therefore, man, as a member of society and as part of a designated group, influence culture within his environs (Tylor, 1929; Honigmann, 1963; Hilliard, 1985). By definition, culture is that complex whole which includes knowledge, belief, art, morals, custom, and any other capabilities and habits acquired by man as a member of society (Tylor, 1929; Webster's New World Dictionary, 1982). Accepting this premise, culture, then, becomes the product of action. Tylor (1929) propositioned that every culture consists of three interrelated dimensions: order, process and goals. Tylor (1929) and White (1949) reported that cultural order encompasses the spatial-temporal patterns of human relationships - patterns which begin with the simplest of form, that of the family, to the most complex, that of the world. In short, culture has a past, present and future - all of which evolve through time in some form or another. Language is the median by which this transition occurs. Language is a universal distinction of human groups (Landes, 1965). Each member of society is trained to respond according to the patterns of his tradition - that of the family as well as to universal expectations - that of the world. Because language is universally and primarily verbal, our ability to comprehend it is predicated upon the adequacy of interpretation. Hence, a common denominator, or bridge of understanding, must be present in order for man to adequately interpret the universal language. Fries (1940) and Webster's New World Dictionary (1982) define Standard English as the particular type of English or dialect which is used in the conduct of the important affairs of peoples. English has become a social and class dialect in the United States. (Hilliard, 1985; Bellugi, 1964). Therefore, if one's basic language development does not proximate the majority speech, then such individual experiences difficulty in interpretations, and, ultimately, with integration into major society. Such difficulty leads to lack of understanding and isolation - a potential hinderance to the educative process.

The second dimension, process or enculturation, is manifested through acculturation - the universal process by which people living in culture arrange (1) to transmit what is most important in their way of life from one generation to the next, and (2) to engage in amending and renewing these ways whenever they perceive that change is necessary to the common good of their environment (Tylor, 1929; Honigmann, 1963; Kroeber, 1944). When acculturation transpires over time, assimilation occurs. Needless to say, the processes of culture often times generate tensions and even upheavals within the individual and society. These strains and imbalances result in distorted views of society's expectations which are, then, reflected in various cultural groups.

Education has been found to be governed by enculturation (Kimball, 1956' Ianni, 1967). The intention of education is the global welfare and learning of all mankind (Glass, 1959). Based upon the principle that culture is learned behavior, education, then, becomes intrinsically interwoven into the framework of culture. Cultural patterns, transmitted through teaching and learning, will continue to be as long as there is human life. The field of education must recognize this process if it is to capitalize upon the benefits of enculturation. Stanley, et. al. (1956) reported that the educator's major responsibility is to initiate each generation into the objective order of culture. This order is evident in nature and awaits perception and transference into inherent law. Education, in terms of its cultural context, similates an operational view of culture related to the progressivist philosophy of education. Knowledge, then is thereby formulated as an active re-creative agent of enculturation to much greater extent than in the case of the essentialist-superorganic partnership.

The learning process is principally one of conditioning. Bernstein (1961) reported individuals acquire knowledge by responding to stimuli of an alien or different environment. Cofer (1963) and Jensen (1968) found learning to be fundamentally a process of personality formulation through emotional acknowledgments prompted by stimuli of persons closest to the learner. Hence, teaching and learning become interwoven with culture. They are inseparable.

The connection of learning as conditioning to teaching as acquired knowledge becomes an intrinsic component of enculturation.

Finally, the third dimension of culture - goals - highlights two concerns. The first addresses the issue of each culture having ownership to its own unique goals and secondly, the issue of commonality in goals found across cultures. If we presume that all cultures have implicit or explicit goals (purposes toward which they endeavor to move with some sense of directions), we can further hypothesize that all cultures possess a sense of values, attitudes, morals, and beliefs germaine to the specific culture. Such a method to cultural goals clearly draws upon the nature and types of values as a functional theory of ethics. The controversy of this approach is that educators need to study the values of people cross-culturally. Such research promotes an awareness and understanding of commonalities in cultures as well as observation of how such goals function within the cultures. This cultural relativism leads to assessing every culture by its own goals and not by majority goals. Such merit amplifies the educative process.

The relation of goals to that of process and order becomes decisive. The goals of any culture help to choose the process or processes that are needed to reach its continuents: how a culture performs consistently relates to what that culture strives to accomplish. Likewise, the classes of order instituted by a culture are molded by what its values condone. The multifaceted dimension of cultural pluralism present in our society poses a critical question for today's educators: What is the educator's responsibility to cultural diversity in the classroom?

Glass (1959) stated the intention of education to be the welfare of man living in culture. Any policy of education that shadows this vision has abandoned its basic principle. In acknowledging the existence of mankind, with all its entanglements, as the supreme purpose of education, then, clearly, professors must realize what this question encompasses. Education, the process of learning, has the responsibility of aiding every pupil or scholar in becoming cognizant of their insurrectionist references coupled with assisting each pupil obtain a greater understanding of human purpose through active partnership.

Our society serves as a microcosm of the world's races, languages, and social conditions. In American universities, "words" serve the median through which man learns of ideas, values, skills, details of knowledge, etc. Abundant use of this prime tool often fails educators in their quest to impart vital knowledge, meaning and understanding to students. Educators tend to use words expositorily, reflecting their own cultural origins and heritages. Such use often alienates, throttles, or even restricts exploratory responses between professors and students of diversified cultures where expressions and definitions radiate or are independent of one another. One word can have an omnibus of meanings, requiring clarification by sound, gesture, intonation or emotion. In multicultural classroms of today, professors are obligated to know duality of meanings and to neutralize differences among the cultures represented in their classes. The presence of cultural diversity in today's classroom presents a serious threat to our educative process when pupil and instructor are not connecting due to words and language.

Professors must have knowledge on WHAT to convey and HOW to impart this wisdom to learners who represent more than one culture or social condition. It is the educator's responsibility to maintain teaching goals; to communicate in harmony with traditional and worldly patterns found in cultures; and to stimulate trust and enthusiasm in learners. It is further charged that educators are conversant on the specific cultures of their students as well as their own. How each culture views relationships with authority figures and how they respond to opportunities for betterment is also essential information for educators to have in their possession. It is imperative that faculty work in ways comprehensible to each group. The methods employed need to be connected to each culture's learning patterns.

Faculty should be supported in cultivating emotional ties and building professional affinities with the social groups or cultures with whom they are relating. Because culture is transmitted through personality and nature and because personalities emerge in society through culture, personality and culture are intertwined. Education guides this process. Suitable learning is evaluated by universal cultural standards. Faculty can capitalize upon this by taking the position that they are simply one culture sharing with another culture. This reduces personal and emotional involvements while allowing the educator to focus on his purpose: tendering or offering knowledge and learning experiences to all participants. The educator's form of relating must not alienate the student. Too often, faculty fail to understand and to recognize sanctioned responses from their students. In these cases, neither group achieves maximum learning and the professor has responded irresponsibly towards the learner.

A lack of awareness about the cultures of their students causes educators to rely solely upon their professional training - training which has mostly consisted of jargon, stereotypic assessments, and American values. Minority groups and subcultures, often turned off or perplexed by these interactions and acknowledgments, respond to the educator in opposites or through withdrawal.

Professors can more effectively connect with their students by asking themselves: "How can I make learning meaningful and within reach of each student in my classroom?" When faculty fail to accept responsibility for teaching each pupil in their class, they reject their profession and penalize their students.

Educators must accept this responsibility since their mission is to teach American traditions to populations of varied origins as well as integrating the traditions of others into the American custom.

Because cultural origins are central to human processes of communication and learning, faculty should select materials, styles, forms, and programs of instruction relevant to their student's background. This means faculty should be responsible leaders, worthy of the title. The conscience that an educator has to appreciate other cultures does not preclude his own values or professional goals; it does, however, mean that he should share these values and increase his own understanding of his values by correlating them with the values, beliefs and morals of other cultures.

If students are reached through the primary principles of their own cultures, they become accessible and open to new experiences and learnings which will, in turn, become an extension of their mother culture.

Perhaps in order to gain cultural awareness of their pupils, professors need to mingle with individuals, families, and social functions within the communities they serve. This means returning to antiquated teachings when educators were active participants in the community. The present isolation of teachers from society, physically and psychologically, promotes staleness, apathy and ignorance.

Americanized or acculturated educators must seize responsibility for translating cultural differences to their pupils. Curriculums of higher education must incorporate these teachings to insure adequate preparation of faculty for diversified classrooms. Minority cultures then become accepted as sources of strength rather than weakness. The implications for education become improved standards of instruction and a preferred, more informed society.

In summary, the profession of education can no longer afford to neglect cultural diversity in society. Professors can no longer experience the luxury of total sciolism in understanding and relating to their pupils in the classroom. The omission of anthropology and other behavioral sciences, except psychology, in educational curriculums speaks to the gross scarcity and retardedness of current educational programs. Current educators have not been given significant opportunity to learn cultures and experience differentness in society. This inexposure has helped to perpetuate the myths and stereotypic attitudes of other cultures and has caused these cultures to either withdraw or to rebell against American values and ideas. This behavior is not due to desire but to self protection and survival. As long as these occurrences prevail, instruction or education will not accomplish its primary aim: global welfare and learning of mankind.

Every grouping has a culture uniquely its own; mankind is the result and expression of culture. There are no identical cultures within society. The divisiveness among cultures distinguishes one culture from another and creates different strata of position and power. Classes emerge from the structure of cultures. Educators are manipulated by personal value judgments and morals which are reflected in their interactions with students. When these values, beliefs and morals are in opposition, the pupil suffers and our educational systems falters.

REFERENCES

Banks, J. and Shin, B. (1981) *Education in the 80's: Multiethnic education* Washington, DC: National Education Association.

Bellugi, U. (1964). The acquisition of language. *Monograph social research child development*, 29: No. 1.

Bernstein, B. (1961). Social class and linguistic development: A theory of social learning. *Education, economy and society*. Glencoe, III: Free Press.

Brameld, T. (1965). *The use of explosive ideas in education*. University of Pittsburgh Press.

Cofer, C. (1963). *Verbal behavior and learning*. New York: McGraw Hill.

Fries, C. (1940). *American english grammar*. New York: Appleton Century.

Glass, N. (1959). "The sociology of education" in *Sociology today*. New York: Basic Books, Inc.

Hilliard, A. (1985). Personal communications.

Honigmann, J. (1963). *Understanding culture*. New York: Harper and Row.

Ianni, F. (1967). *Culture, system and behavior: The behavioral sciences and education*. Chicago: Science Research Associates.

Ianni, F. and Storey, E. (1973). *Cultural relevance and educational issues*. Boston: Little, Brown and Company.

Jensen, A. (1968). *Social class and verbal learning in Social class, race and psychological development*. New York: Holt, Rinehart and Winston.

Kerber, A. and Smith, W. (1972). *A cultural approach to education*. Iowa: Kendall/Hunt Publishing Company.

Kimball, S. (1956). "Anthropology and education" in *Educational Leadership*.

Kroeber, A. (1944). *Configurations of culture growth*. Berkley: University of California.

Landes, R. (1965). *Culture in american education*: Anthropological approaches to minority and dominant groups in the schools. New York: John Wiley & Sons, Inc.

Lohman, J. (1967). Cultural patterns in urban schools. Los Angeles: University of California Press.

Tylor, E. (1929). Primitive culture. 5th Edition. London: J. Murray.

Webster's New World Dictionary (1982). New York: American Book Company.

White, L. (1949). The science of culture. New York: Farrar Straus.

GRADUATE TRAINING FOR ADMINISTRATIVE POSITIONS: A CONCEPTUAL MODEL

by

Janet Burke

University of Lowell

Graduate Training for Administative Positions:

A Conceptual Model

Janet P. Burke

INTRODUCTION

University faculty are generally thought of as functioning in two major roles: (1) as teachers in their classrooms; and (2) as researchers adding to the knowledge in their disciplines. Most members of the faculty, however, eventually adopt a third major role, the administrative role of department chairperson. There are generally two factors which motivate faculty to assume the role of Department Chair. For many faculty the role of chair is seen as the first step in an administrative career, which if successfully managed may eventually lead to the position of dean or vice-president and finally culminate in the role of university president or chancellor. Faculty in this group actively pursue the role of department chair, and view their appointment to the chair as a major positive step forward towards their ultimate career goals. Other faculty, however, regard the role of chair more as a service which must be performed in turn by each member of the faculty. This group initially has no ambitions or desires to seek further administrative positions. This group reluctantly assumes the role of chair, looking forward to the termination of their responsibilities even before they have begun.

How effectively faculty in both groups function as chair depends to some extent upon their personal expectations regarding the nature of the position of department chair, as well as the unique strengths and weaknesses which they bring to the task. For both groups of faculty, however, their experiences as department chair will have a major influence on the probability of their seeking future administrative positions.

Looked at in this perspective, the department chair, then, may well be the most crucial step in an administrative career. Yet there is little if any formal training for this responsibility. It is only recently that seminars and inservice training programs have begun to be offered for department chairs. There is virtually no training available nor courses offered at the graduate level that deal with this area. Graduate training typically prepares the student to conduct research and advance the wealth of knowledge in the discipline. Some recognition has also been given to the need for graduate level training in pedagogical methods, since many students eventually assume teaching positions at institutions of higher education. Yet no attention is given to the need for training in administrative skills.

PURPOSE

The purpose of this paper is to point out the need to include specific training in administrative skills at some point during the graduate school experience. A second purpose of this paper is to attempt to frame a conceptual model for the establishment of such training programs. Supporting the need for the model as well as the model itself are the results of an informal survey conducted among a sample of faculty from varied disciplines regarding their perspectives of the role of the department chair, and whether and how individuals might be trained to better meet the frustrations and challenges offered by the role of department chair.

SURVEY RESULTS

An informal survey was conducted among several faculty members from institutions of higher education in the Boston area. Faculty were asked to respond to a brief questionnaire regarding the role of the department chair, and their experiences with this role. (a copy of the questionnaire is attached as Appendix A.)

All of the faculty interviewed had served as department chairs for some period of time. Although they were from different institutions and from varied discplines, their initial responses were amazingly similar, in that they referred to the tremendous amount of time which the position demanded. They also as a group made reference to the inordinate number of bureaucratic issues which they had to face, and the problems involved in sorting these out. These bureaucratic issues were largely unseen by these faculty prior to assuming the chair. Three of the faculty made reference to a philosophical issue as being of primary importance. Namely, when functioning as chair, were they colleagues or managers of the other faculty in their departments. Should they function democratically or dictatorially. This issue can be a major dilemma.

Two of the faculty in the sample had a very negative view of the role of chair as well as of their colleagues, a view which they did not subscribe to prior to assuming the chair. These chairs saw faculty as self serving and childish, with little sense of collegiality. These two previous chairs were most adamant about never again assuming the role of department chair or any other administraive position. Only one of the previous chairs who was interviewed expressed a ready willingness to assume the role again. This individual, however, had served as acting chair for a six month period, hardly time to get your feet wet. All of the other faculty who had served full three or four year terms were hesitant about their willingness to serve again and qualified any positive response with several conditions, many of which were quite unrealistic.

None of the faculty in the survey had any administrative training prior to their assuming the chair. All but one of them felt that graduate level training might be helpful although they had difficulty seeing how one would go about establishing such training programs.

THE CONCEPTUAL MODEL

Description of the Task

The position of the department chair is often viewed as a no man's land, or a middle ground between faculty and administration, or the front-line of the administration vis a vis the rest of the academic community. The department chair must deal with all populations of the university community: students, faculty, administrators, clerical staff, buildings and grounds, and maintenance personnel. To succceed the chair needs to have cultivated a multitude of traits and skills upon which he can rely as he weaves his way between the complex and often conflicting demands of these various groups. The department chair not only interacts with representatives from all areas of the academic community, but the task is made increasingly complex by the fact that these relationships cover such a wide spectrum of professional disciplines. The chair is confronted with legal issues, educational issues, social issues, psychological issues, and economic issues.

The role of the department chair varies from institution to institution as well as between departments within institutions. The reasons for this are complex and relate to many factors such as age, type and size of institution, systems of faculty governance, economic health of institution and department and the unique psycholgical characteristics of the individuals involved. It will be impossible to deal with these issues here or in a training program other than to point out that they play a role and that it is important to acquaint students with the influence they have on the position of department chair. While it is recognized that the role of department chair varies somewhat, it is also true that there are some fundamental issues which are common to most department chairs. It is these common issues which should be stressed in a training program, along with the development of an appreciation of how the role of department chair may vary.

This paper will approach the design of a graduate level course in administrative skills from two perspectives: (1) the most appropriate methodology for presenting the course material to the graduate student; and (2) what material should be included in the course.

Method of Instruction. Training regarding the role of department chair should utilize several different learning strategies, among which are: (1) readings; (2) case studies; (3) classroom lectures and seminars; (4) internships and practicum experiences. The student should first become acquainted with the field of administration in general through classroom lectures, and assigned readings, and then group and seminar discussions of these experiences. Once a basic understanding of administration in general has been gained the student is ready to investigate the specific role of the administrator in an academic setting, starting with the role of the department chair and progressing through the university hierarchy. Case studies of actual institutions would make an excellent vehicle for this type of learning experience. Finally the student should complete his work with some actual administrative experience through either a practicum or internship experience.

Since the material included is multidisciplinary, the course should utilize the expertise of faculty from many different backgrounds, rather than be taught by only one instructor. Economists could discuss budgets and finances, lawyers could discuss legal aspects of educational administration, sociologists and psychologists would discuss the group and individual issues which often are of concern to the administrator, and educators could discuss issues of curriculum and pedagogy. This multidisciplinary approach drawing on the many resources within the academic community would provide for a rich learning experience for the graduate student.

Course content. The course should first examine the role of department chair in terms of defining its scope and purpose. Attention should be given to the types of leadership style from the democratic to the dictatorial, and the implications of each. Students should have an opportunity to form an impression of the department chair as either a colleague among other faculty or a manager of other faculty. The many tasks of the chair need to be outlined including the dangers inherent in each. Particular concern needs to be focused on the role of the chair as an evaluator for merit, promotion, and tenure. Students need to be made aware of recent legal precedent in this area as well as long standing issues of an ethical and moral nature. Some consideration is also due to the process of being evaluated. Who will decide whether the chair gets promoted, or gets a merit raise? The answer to this question may influence the chairs' behaviors and attitudes regarding their support for the faculty or the administration.

Anyone contemplating the assumption of the chair should know that the role carries with it that of confidant and counselor to faculty in personal as well as professional ways. Issues of confidentiality are paramount and need to be stressed, particularly with younger less mature graduate students.

In relationships with the student body the chair may encounter some very sensitive and emotionally charged issues revolving around grade complaints and sexual harrassment. The chair in such cases must walk a fine line between supporting the faculty and assuring that the student's rights have not been violated.

CONCLUSION

In their tenure as department chairs, individuals will have to deal with legal issues, social issues, psychological issues, and educational issues. Contrary to naive expectations the educational issues may be the least consuming and the most easily dealt with. It is not surprising then that so many former chairs when asked if they would do it again responded, "I've asked myself that question often."

Training in graduate school may well be a meaningful approach to this dilemma. The training should as outlined here be both scholarly and experiential. The validity of the training must be recognized and course credit for this experience should be given and counted towards the necessary credit for the degree being pursued.

In this paper I have attempted to formulate a rough outline of the nature of a graduate level course in administrative skills, and to demonstrate its need. This paper merely offers a conceptual model for a program of graduate training. Many different programs can be designed which would fit this model or framework. I look forward enthusiastically to the design and implementation of actual programs.

Appendix A

Name: (optional) ________

Academic Discipline ________ Institution ________

I. Have you ever been department chairperson?

YES ___ NO ___

1. For how long? ___

2. Did you enjoy it? ___

3. Would you do it again? Would you consider being chair?

Yes ___ No ___ Yes ___ NO ___

Why? ________ Why? ________

________ ________

4. What was the most difficult aspect of being chair?

5. Have yuor experiences as chair influenced you regarding other administrative positions?

Yes ___ No ___ How? ________

____

II. Did you have any training in graduate school for department chair, or any other administrative positions?

Yes ___ No ___ What specific training? ________

____

III. Do you thing that graduate students should receive some training in this area? ________

Any suggestions? ________

____

Iv. Any other comments? ________

____

MESSAGES IN THE CLASSROOM: CULTURE IS COMMUNICATION

by

Jean M. Civikly

University of New Mexico

Culture is a lot like a computer. Just as the computer is programmed to carry out certain functions, so too culture acts as an internal program which directs one's behaviors and reactions. But, as Edward T. Hall (1976) has cautioned, ". . . culture equips us with built-in blinders, hidden and unstated assumptions that control our thoughts and block the unraveling of cultural processes."

Many of us, although computer-users are not computer-smart; and although culture-users, we are not culture-smart. Other than attributions to magic or miracle, we cannot articulate how the computer or culture actually functions. And unless one is a trained technician, the systems and parts of the computer and culture machine remain mysterious and unknown. This lack of understanding and familiarity easily gives rise to fear, discomfort, and a reluctance of approach. Not being able to put one's finger on the problem only increases the sense of discomfort. But if necessary for livelihood, one may force onself to interact with the machine and learn the new rules for that interaction. Programs and courses have been designed to address this apprehension and to treat this "high tech" phobia -- computer anxiety, and many international organizations have considered the issue of culture shock.

As is already true for culture, we are becoming dependent on computers in order to get through the day's activities: food shopping, bill paying, loaning library books, and identifying problems in the car engine. Our responses to the computer and culture are also similar. When the system works, it is marvelous and gratifying. But when there is a malfunction in the system, or we are the source of the error, either nothing happens or the printout is drastically inaccurate and uninterpretable. In such instances, it is not uncommon to witness displays of frustration, anger, disgust, attack or surrender evidenced by hand rapping, grunts and groans, shouting and mumbling, fatigue, or alienation. What can be done to reduce the frequency of malfunctions and to relieve the counter-productive behaviors that accompany such times?

In my academic discipline, speech communication, a prominent theory about the goal of human communication is to reduce uncertainty in one's world such that one can make reasonably accurate predictions about self and others (Miller and Steinberg, 1975). The thesis proposes further that predictions will be more accurate as more knowledge about another person accrues (that is, the more one knows what makes that person unique). Ironically, the contribution of culture, which is at the core of one's communication behaviors, often has been overlooked in the attainment of that prediction accuracy. The intent of this essay is to suggest how culture is reflected and projected in one's communication behaviors, with particular reference to instructor and student communication in college classrooms.

In a soon-to-be-published essay entitled "The Ethnocentric Classroom," John Condon argues that there is a college classroom culture and that the norms for behavior and values by which students are judged are largely extensions of the mainstream Anglo culture. This academic culture includes one's values, assumptions, expectations, and behaviors regarding such things as verbal style, nonverbal self-presentation, competition, self-disclosure, and criticism. While instructors usually are aware of the cultural diversity among students, evident most often from physical appearances, "the most important considerations are those which are not so apparent: how the student has been taught to view the world and to act and react" (Condon, 1986). In the academic culture, most teachers regard their own class behavioral norms as those to which the students from all backgrounds must adjust. It is in this sense that the classroom is ethnocentric as these norms are, for the most part, extensions of mainstream American culture and educational tradition. Manifestation of this overlay of academic and mainstream cultures is found in course texts, syllabi, activities, discussion topics, and in the verbal and nonverbal messages that occur during instruction. While the preceeding computer-culture analogy served to identify general concerns, identification of more specific behaviors should increase attention to the issue of culture and hopefully stimulate sensitivity to behaviors common in classroom instruction.

The list of communication behaviors provided in Table 1 has been assembled from students' and teachers' personal accounts of class proceedings, and from concepts discussed in works by Spindler (1969), Rich (1974), Kochman (1981), Hall and Sandler (1982), Wu and Morimoto (1983), and Civikly (1985). While several of these behaviors are distinctive to the role of teacher or student, the majority can be evaluated as behaviors that might be displayed by both students and teachers. In reviewing each behavior, it is helpful to reflect on one's own preference and to speculate about how preferences of others having different cultural influence might vary from one's own and impact on class interactions and effectiveness.

While the behaviors listed in Table 1 may give the impression of being descriptive in nature, the process of defining and interpreting each behavior according to one's own cultural upbringing and communication norms is inevitably subjective. Kochman's (1981) description of a class interaction between black

CLASS CLIMATE	CLASS INTERACTIONS
1. role of emotions and reason in learning	1. addressing others by first name
2. role of books, research, tradition, observation	2. use of compliments and rewards
3. importance of citing sources of "authority"	3. motivational incentives
4. importance of stating one's personal position	4. use of direct questions and responses
5. definition of success and class performance	5. teacher's verbal and nonverbal reactions
6. definition of failure and class performance	6. use of humor and teasing
7. approachability to teacher as role-model	7. use of silence
8. approachability to teacher for counsel	8. use of touch and close proximity
9. adherence to due dates, class attendance	9. self-disclosing communication
10. definition of courtesy and politesse	10. use of bristle statements and behaviors
11. preference for group or individual work	11. nonverbal listening behaviors & attentiveness
12. preference for cooperative or competetive tasks	12. interruptions and turn-taking
13. encouragement to participate, persevere, explore	13. ownership of opinions: "I believe, I feel"
14. preferred manner of decision making	14. "wait time" provided for other to respond
15. preferred manner of conflict management	15. student challenging/questioning the teacher
16. demonstration of respect and personal regard	16. teacher challenging/questioning the student
17. overall tone--defensive, supportive, animated	17. student challenging/questioning other students
18. expectation for person to serve as spokesperson for his/her group	18. participation in class discussion: required? encouraged? expected? graded?

Table 1

and white students should help illustrate this perceptual-interpretive process. The situation described involves student turn-taking during a class discussion:

> Because blacks consider turns to consist of fewer points than do whites, they often come in to argue a point before whites have "finished." This whites consider rude. However, blacks believe a turn is over when a point has been made on which others wish to comment. Consequently, they consider whites selfish for "hogging the floor" or not allowing the process of argument to be activated. It is then that blacks attempt to take the floor, feeling that the white claim to undivided and noncompetitive attention has been forfeited. If they are unsuccessful in this, they may start another simultaneous conversation with whoever will participate in it (Kochman, 1981, pp. 28-29).

A student account of an instructor's communication style, provided by Cones (1983), also suggests a collision of perceptions:

> "Several times, we would be sitting in the room with the same professor. He would go around and ask questions, and if I answered the question correctly, he would tell me in front of the group, 'Oh, you guessed, you guessed the question. You got that answer right because you guessed.' No one else guessed but me. I may have been the only one who answered correctly, but I guessed!"

Not surprisingly, many of the disconfirming behaviors cited by Hall and Sandler (1982) in their research on "chilly classroom climate" for women parallel situations noted by minority students and can be summarized as an overall lack of attention, recognition, eye contact, or guidance from the instructor. In conversations with Hispanic, Native American, and international students, reports of such teacher behaviors are not uncommon.

The professor's behavior described by Cones (1983) is a good example of one of the concepts listed in Table 1: bristle statements and behaviors. "Bristles" are relatively easy to identify. A good sign that a bristle has occurred is when you respond to another's statement or behavior in a negative way, such that you "bristle" at the derogatory implications made by the person. Whether or not those implications are intentional, you may find yourself tensing, and the little hairs on the back of your neck stand up and bristle -- the person has succeeded in "ruffling your feathers." Bristles have been discussed in racial interactions by Daniels (1960) and Rich (1974), and have also been extended to the classroom culture of students and teachers (Civikly, 1983). An example of a teacher statement that often bristles students is "Don't get so upset -- it's only a grade." Two classic student statements likely to bristle a teacher are "Are we doing anything important in class today?" and "What can I do to get an A in this class?" (usually queried a week or two before the final exam).

It is often the case that individuals do not understand why their statements or behaviors bristle others. In order to identify such situations, increased sensitivity to others' reactions needs to be developed. It is also helpful to learn what statements and behaviors bristle you. In so doing, I have found that I can avoid retaliating with a counter-bristle and thereby move the discussion along. In my training of teachers for public education and for university teaching assistant appointments, I discuss this concept of bristles and frequently ask students to generate a list of professor behaviors, verbal and nonverbal, which bristle them. In addition to sharing bristle examples, students express appreciation for being asked what "bugs" them, and report that the image of bristles is very helpful in monitoring their communication in both teaching and social interactions.

The student accounts of teacher bristles and preset classroom norms suggest that the classroom can be a very risky place for students, particularly for students of backgrounds different from that of the teacher. In research on retention of minority students in higher education, Sedlacek (1983) reports that seven student and class variables have predicted retention for these students: (1) a realistic self-appraisal; (2) understanding and dealing with racism; (3) preference for long-term goals; (4) availability of a strong support person; (5) successful leadership experience; (6) demonstrated community service; and (7) a positive self-concept. For each variable, Sedlacek suggests specific ways in which teachers can promote these qualities.

If improvement of college classroom interaction and student retention is desirable, several steps in addition to Sedlacek's recommendations, may also be taken. First, to reduce the risky nature of the classroom, teachers and students need to remind themselves on a daily basis about the subtle and overwhelming influence that culture has on one's behaviors and on reactions to the behaviors of others. Each is following ingrained and unquestioned norms for acting. A start on this is to learn more about the dynamics of culture in any number of ways -- courses, interactions at work, school, and social settings, films, and books. Second, sensitive observation of others' verbal and nonverbal messages and self-monitoring of the same may identify when and why interactions become unproductive or even destructive. Review of the behaviors in Table 1 can help in this sensitization process. Perhaps the closest we can get to stepping outside ourselves is to hear and see ourselves on audio and video recordings of class instruction -- excellent and accessible tools for communication sensitization. Finally, frequent interaction with persons of backgrounds different from one's own should serve to develop a sense of ease and familiarity, and lead one to the goal noted earlier: uncertainty reduction and improved communication. This learning about others' cultural backgrounds has a double payoff in that as you discover others' values and behaviors, you also learn about your own.

In concluding, were I to forecast the progress of learning about one's culture and its impact on others, I would return to the introductory comparison of culture and the computer, and would conclude a more positive outcome for computer learning. Why so? First, the computer, although admittedly complex, is visible and touchable. Culture is an abstraction that overwhelms us in its manifestations. It is all around us; we cannot avoid it or transcend it. How we see the world, ourselves, and others is all viewed through our cultural filters.

Second, despite its relatively recent appearance, the computer is being viewed as a necessity in our society and is gaining a sense of commonality and familiarity. Culture, which has a far more extensive life, remains a stranger, even to its own carrier, let alone to persons of different backgrounds. Culture is overlooked or taken for granted rather than being viewed as a necessity for our society.

Finally, as computers become more familiar, ordinary, and accepted, they become more approachable. Consider the computer technician who approaches the system with confidence, ease, and respect. The same thoughtful behaviors can be expected of culturally-sensitive individuals. Are they not more likely to explore themselves by extending themselves to others of different backgrounds?

Imagine what it would be like to be involved in a class in which the participants, teacher and students, were so enlightened? Is this image the material for a science-fiction or fantasy show production? No, for with work and care, this is the material for a real-life documentary.

REFERENCES

Civikly, J.M. "Classroom Teaching Skills" (Teaching Assistant Resource Center Handbook). Department of Speech Communication, University of New Mexico, 1983.

Civikly, J.M. "Diversity in College Classrooms" (Teaching Assistant Resource Center Instructional Unit). Department of Speech Communication, University of New Mexico, 1985.

Condon, J.C. "The Ethnocentric Classroom," In J.M. Civikly (Ed.), Communicating in College Classrooms. New Directions for Teaching and Learning, no. 26. San Francisco: Jossey-Bass, 1986.

Cones, J.H., Janha, D., and Noonan, J.F. "Exploring Racial Assumptions with Faculty," In Cones, J.H., Noonan, J.F., and Janha, D. (Eds.), Teaching Minority Students. New Directions for Teaching and Learning, no. 16. San Francisco: Jossey-Bass, 1983, 73-79.

Daniels, J.L. "The Facilitation of White-Black Communication," Journal of Communication, 1970, 20 (2), 134-141.

Hall, E.T. Beyond Culture. New York: Anchor Press/Doubleday, 1976.

Hall, R.M., and Sandler, B.R. The Classroom Climate: A Chilly One for Women? Washington, D.C.: Association of American Colleges, 1982.

Kochman, T. Black and White: Styles in Conflict. Chicago: University of Chicago Press, 1981.

Miller, G. R., and Steinberg, M. Between People: A New Analysis of Interpersonal Communication. Chicago: Science Research Associates, 1975.

Rich, A.L. Interracial Communication. New York: Harper and Row, 1974.

Sedlacek, W.E. "Teaching Minority Students," In Cones, J.H., Noonan, J.F., and Janha, D. (Eds.), Teaching Minority Students. New Directions for Teaching and Learning, no. 16. San Francisco: Jossey-Bass, 1983, 39-50.

Spindler, G.D. "The Transmission of American Culture," Florida FL Reporter, 1969, Spring/Summer, 1-9.

Wu, J., and Morimoto, K. "On Careful Listening," In Cones, J.H., Noonan, J.F., and Janha, D. (Eds.), Teaching Minority Students. New Directions for Teaching and Learning, no. 16. San Francisco: Jossey-Bass, 1983, 51-57.

THE FATE OF A CULTURALLY DIVERSE LIBERAL ARTS CORE PROGRAM: THE MEDGAR EVERS COLLEGE EXPERIMENT, 1977-85

by

Michael Fitzgerald

Medgar Evers College of the
City University of New York

Introduction

When it unveiled its Liberal Arts Studies (LAS) program in 1977, Medgar Evers College of the City University of New York set several precedents. First, its liberal arts program antedated the highly publicized revision of Harvard`s core curriculum, and therefore was not another Rosovsky clone; second, its curriculum included such culturally diverse materials as feminist and third-world perspectives, and so was not just another "Great Books" rehash. The LAS program at Medgar Evers was geared specifically to the unique educational needs of urban minority students, in this case mostly Black and Hispanic females. In the minds of many at the college, it was a grand experiment, a noble attempt to bridge cultures and build careers. Not surprisingly, the LAS program attracted generous support from federal sources, which allowed a team of administrators, faculty and consultants to plan, coordinate and evaluate the program over nearly a decade. The Medgar Evers experiment appears to qualify as an instructive case study of cultural diversity in higher education.

In what follows, I shall describe the program and outline its history. Where appropriate, I shall analyze the administrative and pedagogical grounds for its difficulties, using a variety of sources to document my findings, including program descriptions, course syllabi, interviews, evaluation reports and administrative memoranda. I shall conclude by offering some suggestions for similar programs.

The Medgar Evers Student Body

Since it opened its doors in 1971, Medgar Evers College has served a heterogeneous clientele with special requirements. Drawing principally from the populace of central Brooklyn, the college has been required by the City University's open admissions policy to admit any high school graduate with an average of 'C' or better. Virtually all students are members of some ethnic minority, and three-quarters of them are female. Many have immigrated from the Caribbean basin; some have come from Africa. There are students from South and Central America. Asians as well as Arabs have matriculated at the college. Between classes, the central building becomes a Tower of Babel, with scores of languages, dialects, and patois crowding the air. In short, the demographic profile of the college is strikingly international, particularly in contrast to the small number of full-time students, approximately 2500.

Many of these students require remediation in the basic skills of reading, writing and reckoning. In some cases this is due to poor preparation at the secondary level; in other cases it stems from difficulties with English. The wide disparity among students in preparedness for college study may explain the extraordinarily high rate of annual attrition found among freshmen at the college, sometimes exceeding twenty-five percent.

Regardless of ethnicity or preparation, students at the college share a fundamental expectation: that they will receive significant professional or vocational training at Medgar Evers. The most popular major is Business Administration, followed by

Teacher Education and Health Science. The college has met this demand for work-related study through a vigorous program of cooperative education and a Career Development Center.

The LAS Program at Medgar Evers

Both faculty and administration were eager from the start to provide a curriculum which would meet this expectation and also provide a broad undergraduate education. Given the clientele, a traditional liberal arts program seemed unworkable. Administrators recognized that the usual academic fare of Homer, Shakespeare and Tennyson would not sell at the Medgar Evers campus. Moreover, a core requirement of general studies already existed, and was bolstered by a Basic Skills program. Yet misgivings were being voiced concerning the first graduating classes. Worries persisted that the college's graduates were deficient in terms of "what every educated person ought to know," as one senior professor voiced her concern. The prevailing sentiment among the professoriate was that students were ill-prepared to cope with the world outside their own geographical and cultural boundaries. Furthermore, even the advocates of a strict curriculum of vocational-professional studies conceded that the vagaries of the job-market necessitated general training to keep open career options. The time had come for a new approach to the curriculum.

In the Spring of 1977 the Dean of Academic Affairs, an outspoken proponent of the humanities, suggested that the college institute a liberal arts core which would not only prepare students for the workplace, but would also supply them with the means for making value judgments and ethical commitments. The

Dean envisioned a program which would increase the students' self-understanding while expanding their knowledge of, and tolerance for, other cultures. The program would give students general career skills as well as a sense of responsibility to the community.

The vision soon elicited support from most quarters, including the campus Title III director. With Title III support, the LAS program was established in the Fall of 1977. It was conceived as an interdisciplinary, multi-ethnic, non-sexist curriculum mandated for all Medgar Evers students. It comprised seven courses, four required for the associate degree and seven for the baccalaureate degree. Each course focused on a specific aspect of the environment. Two LAS courses in the Humanities focused on the cultural environment, integrating the disciplines of the communicative arts, the visual arts, dance, music, literature and philosophy. Two LAS courses in the Division of Social Sciences concentrated on the societal environment, integrating economics, political science, sociology, psychology, anthropology and law. The bio-physical environment became the subject of two LAS courses in the Division of Natural Sciences and one in the Division of Health Science. These offerings brought together the disciplines of chemistry, physics, mathematics, astronomy, biology and health care.

The goals and objectives for the LAS program were clearly formulated and strategies were devised for their implementation. The concept of cultural diversity became a central theme in these statements of purpose. Take, for instance, this instructional objective: "to foster in . . . the student body a greater tolerance, appreciation and understanding of other societies and their cultures with emphasis on the role and function of women in these societies." To illustrate the degree to which cultural diversity actually entered the curriculum, here is a group of required texts taken from the lower level social science course syllabus (LAS 102, "Culture, Society and Social Change"), described as "exemplary" by the LAS coordinator:

Diop, Chekh Anta. *The African Origin of Civilization: Myth or Reality* (Westport, CT: Lawrence-Hill, 1978).

Dye, Thomas R. *Power and Society. An Introduction to the Social Sciences* (North Scituate, MA: Duxbury Press, 1979.

Dubois, W.E.B. *Color and Democracy* (Millwood, NY: KTO Press, 1977).

______________. *Dusk of Dawn* (New York: Schocken Books, 1968).

Heilbroner, Robert. *The Limits of American Capitalism* (New York: Harper and Row, 1966).

King, Martin Luther. *Strength to Love* (New York: Harper and Row, 1963).

Mao Tse-Tung. *Five Essays in Philosophy* (Peking: Foreign Languages Press, 1968).

And here is an example of a writing assignment in one of the humanities LAS components (LAS 201, "Visions in the Humanities"): "Imagine that Socrates, Machiavelli, Pushkin's Pyotr Grinyov and Frederick Douglass have assembled to discuss 'the peculiar institution,' human slavery. In a four-page script, provide for each of these characters lines of dialogue which are consistent both with their philosophical-political views and with their modes of linguistic expression. Attempt to extrapolate from our readings this semester how these men would have interacted verbally."

Of course, the program also contained much traditional material. Other courses required the reading of works by such canonic authors as Plato, Cervantes, and Goethe. The Natural Science LAS courses, in particular, tended to use customary readings--Bronowski, Watson, Eddington, Kuhn, etc. Still, the syllabi for these courses contain modules which explicitly address the role and status of racial minorities in modern science.

Evaluations of the LAS Program

By the Spring of 1982 the program had been operating for five years and a composite assessment of its performance was emerging. Two major external evaluations had been completed, one by a Title III federal evaluator (Norton, 1980), the other by a Harvard-trained educational psychologist (Fleming, 1981). Internally, annual reports on the LAS courses were submitted by the respective divisions in which these courses were taught (LAS staff). These frequently contain helpful suggestions for revising the program. But by far the most cogent and telling assessments came from the LAS coordinator (Nunez-Harrell).

The external assessments indicated that the program was meeting its goals and objectives. The federal evaluator made two important recommendations that had already been suggested by the LAS staff: first, each LAS course should have a single text containing anthologized readings and study assignments rather than multiple texts with no standardized assignments; second, the program should be expanded to include a cultural component which would complement the in-class work of the LAS courses. While this second recommendation was implemented fully, the goal of developing proprietary texts was not realized, even though much material was collected.

The second external evaluation was two-edged. It sought to determine the impact of the program by measuring (1)academic performance and (2)something called "change-agent status," a measure of student attitudes regarding involvement in the community and society. The study revealed that participation in the LAS program was unrelated to cognitive growth or academic performance; no differences in grades were found as a function of taking LAS courses, a singularly disappointing result. On the other hand, participation in the program resulted in higher scores among males on the change-agent scale, an indication that their orientation toward active participation in their environment had altered significantly as a consequence of the program.

The staff reports show a persistent concern with the curricular content of the LAS courses. In particular, faculty sought to achieve agreement as to the specific themes and topics to be covered in individual courses. As a result of these concerns, a number of faculty development seminars were funded which allowed the content of individual LAS courses to be standardized in a modular approach.

The program coordinator was extraordinarily candid in her assessments. Here is a synopsis of her most significant observations: (1)The program cannot be run by a coordinator who is only partially released to oversee it. A full-time director is needed to insure that the interdisciplinary aspects of the program are coordinated properly. In fact, the program probably should be housed in a separate LAS division with generalist faculty specially appointed to it. (2)The program has become fragmented among the college's academic divisions, where divisional loyalties have led to internecine bickering over the program's interdisciplinary nature. As a result of this fragmentation, the academic divisions tend to make their LAS courses little more than introductory surveys of their respective fields. (3)Furthermore, the lack of interdisciplinary coordination allows duplication to occur throughout the program so that, for instance, the theme of "evolutionary theory" recurs in several LAS courses. (4)The evaluative instruments used in the program need to be refined and longer-range studies completed to ascertain the program's actual outcomes. A value-added test should be developed for use in the program. (5)In some courses, the very breadth of cultural diversity found in the LAS curriculum has precluded careful analysis of individual works. Faced with an enormous amount of material to cover, instructors have been forced either to treat material superficially or to omit it entirely. In classes where this happened, there was a tendency for student discussion to lose focus and to wander haphazardly across the academic landscape. Because of the predominance of Black students, discussion during these "rap" sessions frequently returned to Afro-American topics, which often excluded discussion of other cultural points of view. Rather than expanding the horizon of class discussion, such digressions parochialized it.

I think there are valuable lessons to be gleaned from the Medgar Evers LAS experiment. First, culturally diverse liberal arts programs must have a strong central direction; otherwise, the components of these programs either may assume a willful autonomy or, worse still, drift aimlessly. Second, classroom instructors should be faculty with diverse interests or interdisciplinary training. Specialists tend to get stuck in their own bailiwick or to trivialize the insights of disciplines other than their own. Third, some measures of the program's outcomes are essential. Administrators should have some means for establishing the worth of the program within a relatively limited time period. Finally, appropriate materials should be developed for meeting the program's goals and objectives before the program is offered, and these materials should consist mainly of primary sources, not secondary digests. This is particularly the case in programs that emphasize cultural diversity. Why should minority students get hearsay when other students get it from the horse's mouth?

The Medgar Evers LAS program continues to function. However, its days would appear to be numbered. In the past two years, a select committee has been contemplating a wholesale revision of the entire core curriculum at the college, including the LAS program. Whatever the result of these deliberations, the program has served a fundamental purpose. It has succeeded in nourishing the idea that a culturally diverse liberal arts program is a vital part of a college education, particularly for minority students. It has succeeded in germinating the seeds of a more comprehensive approach to undergraduate learning based on the liberal arts. Finally, it has succeeded in expanding the traditional basis of the liberal arts beyond their narrow Euro-American bias.

THE LATIN LINK BETWEEN ENGLISH AND SPANISH: METHODOLOGICAL IMPLICATIONS FOR LANGUAGE INSTRUCTION, MOST ESPECIALLY IN THE SOUTHWEST

by

George K. Green

Pan American University at Brownsville

THE LATIN LINK BETWEEN ENGLISH AND SPANISH: METHODOLOGICAL IMPLICATIONS FOR LANGUAGE INSTRUCTION, MOST ESPECIALLY IN THE SOUTHWEST

A story is told about an American teen-ager who upon graduating from high school with unusually high grades received an all-expenses-paid trip to Mexico from his father as a graduation present. The teen-ager was surprised and delighted by the present but somewhat worried by the prospect of communication problems, as he knew absolutely no Spanish. However, a friend of his, who had studied Spanish for a semester or two in high school, soon informed him that communicating with the Mexicans was really quite easy, that in fact it was possible to add an "o" to most English words in order to form the Spanish equivalent: "rapid", "rapid-o"; "concept", "concept-o"; "cheap", "cheap-o"; "mechanic", "mechanic-o"; "respect", "respect-o", etc. Thus reassured, the graduate hugged his father, kissed his mother, waved good-bye to his friends, and boarded an early-morning flight to Mexico City.

Once in the Mexican capital, he took a taxi to his hotel, checked in, left his luggage, and immediately embarked upon one of the bus tours included in his all-inclusive trip package. The tour took him and a large group of other tourists way up into a pine forest on one of the highest of the surrounding mountains, where it was quite cool because of the altitude. Seated on the bus, for quite some time he had been noticing a very attractive Mexican girl sitting across from him and had been trying desperately to think of something to say to her in Spanish. Focusing on the English word "cool" in view of the coolness of the air at that high altitude, he remembered his school chum's formula, hardly realizing that the Spanish word "culo" is an anatomical reference to the human posterior and considered particularly vulgar in Mexico. At that point, he turned to the girl and said haltingly, "Buenas tardes, señorita, mucho cool-o." At this, the girl smiled, winked, and replied somewhat sarcastically, "Sí, ¡cómo no!; ¡pero no para ti, gringo!" ('Yes indeed, but not for you, gringo.')

The young American tourist must have soon learned that not all Spanish words end in "o", because upon returning home he is reported to have remarked with something more than a hint of complaint, "'Sopa' isn't 'soap', 'ropa' isn't 'rope', and butter is 'meant to kill ya'."

The anecdote contains just a grain of truth as far as the large number of lexical forms common to both English and Spanish is concerned. Of course, now the principal source of such forms is not English at all, but rather Latin. Spanish, a romance language, is derived directly from Latin, being like French, Portuguese, and Italian one of the several major provincial dialects of the Romans' language that evolved into new national languages upon the dismemberment of the Roman Empire about the 5th century A.D. The vast majority of Spanish vocabulary, perhaps 80%, is derived from Latin, either in a centuries-long evolution from oral Latin or through later borrowing from written Latin.[1] On the other hand, the English language contains a large Latin vocabulary received indirectly from Old French, which was imposed as the administrative and upper-class language of England for several centuries following the Norman Conquest in 1066. In addition, a considerable number of Latin terms have been adopted by English as part of its scientific and technical terminology. The fraction of English vocabulary derived from Latin has been variously estimated as from 40% to 60%, but "more than half" might be considered a safe rule of thumb.[2] This relatively wide disparity in estimates is, in part, the result of considering differing types of English language texts. The higher estimates are quite invariably those of linguists whose primary interest is literary or academic language, whereas other scholars who concern themselves rather with oral language arrive at a substantially lower figure.

A review of the literature has, as yet, revealed no estimate of the Latin forms common to both English and Spanish. However, random sampling of dictionaries, written texts, and oral language by this investigator would indicate that approximately one third of English and Spanish words contain at least one common root, most often Latin but sometimes Greek, Indo-European or of other origin. This percentage drops slightly in colloquial Spanish, and quite substantially to about 17% in the case of colloquial English. There seems to be some truth to the commonly-held theory that colloquial English contains a high percentage of Anglo-Saxon words. On the other hand, the percentage of common forms rises considerably when academic or technical language is considered. A sampling of the entries in a bilingual medical dictionary revealed that fully half of them contain recognizably similar forms in both languages.[3] In any case, no amount of statistics can ever reveal the full nature fo the Latin Link between English and Spanish.

One of the most interesting cases of this lexical common ground between English and Spanish is the word that has exactly the same written form in both languages, although its meanings may vary quite substantially from one language to another and although its pronunciations may and do vary so greatly between English and Spanish as to make each of the two oral forms almost unrecognizable to monolingual speakers of the other language. Excluding mutual borrowings such as "sweater", "revolver", "leader", and "meeting" in Spanish and "rodeo", "lariat", "bronco", "tortilla", and "taco" in English -- one group of the most common such forms are nouns and adjectives of Latin origin with the endings "-ar" and "-al", a complete list of which would certainly encompass more than a hundred lexical items, and perhaps more than two hundred: "vulgar", "universal", "oral", "error", etc.

Of such words, ten were chosen for an experiment in oral perception among monolingual speakers of the two languages: (1) "regular", (2) "popular", (3) "rural", (4) "real", (5) "valor", (6) "formal", (7) "color", (8) "horror", (9) "actual", and (10) "metal". All are of Latin origin, except that a purist might object that the root of "popular" was borrowed by the Romans from the Etruscans and that "metal" may go back to a Greek form. Twenty test subjects were selected -- ten monolinguals of each language -- with a minimum age of 15, some secondary education, and a very limited knowledge of the other language from among tourists stopped at gas stations, convenience stores, and restaurants on International Boulevard in Brownsville, Texas. By observing license plates, it was easy to find ten English-speakers from the northern United States with virtually no knowledge of Spanish. However, it proved somewhat more difficult to find Spanish-speakers with little knowledge of English, even from among tourists from the interior of Mexico and from among the few Central Americans. Ten of each group of monolinguals were asked to attempt to write any of the words that they might recognize. They were informed that all ten words had the same exact written form in both languages. Each word was read three times and only three times despite numerous requests for further repetitions. However, ample time was allowed for reflection and writing answers. Perhaps surprisingly, the rate of word recognition, which was roughly the same for both sets of test subjects, was only about one out of ten, as indicated by the tables below.[4]

ENGLISH SPEAKERS: TOTAL OF TEN TEST SUBJECTS

NO. OF WORDS RECOGNIZED	0	1	2	3
NO. OF SUBJECTS	3	5	1	1
WORDS RECOGNIZED		"regular" "regular" "regular" "popular" "rural"	"regular", "popular"	"regular" "real" "metal"

SPANISH SPEAKERS: TOTAL OF TEN TEST SUBJECTS

NO. OF WORDS RECOGNIZED	0	1	2	3	4
NO. OF SUBJECTS	2	3	3	1	1
WORDS RECOGNIZED		"popular" "formal" "regular"	"regular", "real" "popular", "formal" "regular", "popular"	"regular", "valor", "color"	"regular", "rural", "formal", "metal"

The failure of the twenty test subjects to recognize the Latin forms known to them in their native language when these forms were pronounced in the manner of the other language is not entirely unexpected, although the degree of this failed perception might perhaps be surprising. The failed perception may be attributed primarily to two factors: differing stress patterns in the two languages and English vowel sounds. All the English words in this group have the primary stress on the initial syllable; all the Spanish forms in this group are "palabras agudas" (stressed on the last syllable).[5] In addition, the final syllable of all ten English words contains a schwa, a barely-articulated mid central vowel that is quite unlike any Spanish vowel. An additional factor might well be the fact that the word-final liquids, "r" and "l", in the English words are far more open than their Spanish equivalents.

In fact, the Latin Link between English and Spanish is largely written in nature. Both languages employ what is basically a Roman writing system, although with a modern distinction between large and small letters, with spacing between words, and with punctuation marks -- all of which were entirely unknown to the ancient Romans. However, this common writing system masks very different sound patterns.[6]

Spanish boasts five highly-stable vowels, vowels that are relatively similar to the Latin vowels from which they evolved over the centuries, except that the old Latin distinction between long and short vowels has been lost and except that the internal post-tonic or internal pre-tonic vowel of many Latin forms have been eliminated in the evolution to Spanish.

Spanish consonants, on the other hand, have evolved greatly over the ages: there were noteworthy changes in the consonants from late vulgar Latin to medieval Spanish; medieval Spanish included several consonant sounds that are no longer found in modern Spanish. Modern Spanish spelling, virtually without exception, reflects the modern consonant sounds thus masking a considerable number of Latin roots that we find spelled with the original Latin consonants in the English equivalent. For example, the unvoiced stops of Latin that we spell "p", "t", and "c" or "k" became voiced in Spanish: Latin "p" became Spanish "b", Latin "t" became Spanish "d", and Latin "c" became Spanish "g". Thus the English word "acute" is from the same Latin root as the Spanish "agudo"; English "secure" is related to Spanish "seguro"; and English "delicate" corresponds to the Spanish "delgado". To mention just one more case of consonant evolution from Latin to Spanish, Latin "x" between vowels, Latin "li" between vowels, and Latin "c" plus any vowel plus "l" between vowels all evolved to an intervocalic "j" in modern Spanish. Thus, English "axis" and "axle" are from the same Latin root as their Spanish equivalent "eje"; English "alien" maintains the Latin root that has evolved to "ajeno" in Spanish; English "ocular" corresponds to Spanish "ojo" ('eye').

Moreover, modern Spanish spelling has eliminated all double consonants, except for double "c" and double "n", which is relatively rare. Thus, we find "aggressor" in English with two double consonants vis-a-vis "agresor" in Spanish with no double consonants.

Finally, syllable-final consonants in Spanish, which are generally articulated less clearly than consonants in other positions, tend to be lost. For this reason, many Spanish words contain the same Latin root as an English word but without one or more syllable-final consonants. (It should be noted here, as a general rule, that in Spanish the first of two consonants between vowels is in syllable-final position if the second consonant is neither "r" nor "l". Three consonants between vowels are divided after the second, unless the third consonant is "r" or "l", in which case the split comes after the first consonant.) Thus, we find in Spanish the form "sustancia" without the syllable-final "b" of the English equivalent "substance". In the Spanish "distrito", "instinto", "objeto", and "respeto", we note the absence of the syllable-final "c" preserved from Latin in the English words "district", "instinct", "object", and "respect".

In English, on the one hand, the spelling system generally maintains the original form of the Latin root, although the word-final vowel of late vulgar Latin is most often lost, as in "district" or "object" (Spanish: "distrito", "objeto"). On the other hand, the widely-varying vowels of modern English, especially the reduced mid central vowels, or schwas, of unstressed syllables tend to mask the Latin root form for speakers of romance languages.

Apart from consideration of the isolated forms that we have been examining up to this point, there exist other important differences between the sound systems of English and Spanish that further increase the mutual unintelligibility of English-speakers and Spanish-speakers despite the substantial number of common Latin roots. English is described by linguistics as having open juncture, whereas Spanish is said to have closed juncture. English phrases are produced a word at a time: there is generally a pause after each word. Spanish phrases, on the other hand, are pronounced syllable by syllable: there is usually no pause after a word. For example, in the brief phrase "el amigo", the syllables are "e-la-mi-go". A certain Argentine folksong ends with the Spanish equivalent of 'with an illusion', "con una ilusión", whose syllables are "co-nu-nai-lu-sión". Moreover, whereas English syllables vary greatly in relative length, Spanish syllables do not, and although English word stress patterns are often shifted for reasons of emphasis, such is not the case in Spanish.

Our conclusions regarding the Latin Link between English and Spanish, which are relatively obvious, concern the methodological implications for language instruction, most especially in the southwestern United States where Spanish is widely spoken. Any language instruction involving the two languages under consideration — ESL for Spanish-speakers, Spanish foreign-language instruction for English-speakers, or bilingual education -- should decidedly stress written language use. Our modernized Roman writing systems of English and Spanish offer an excellent memory aid in the case of a large number of cognates. A literate Spanish-speaker will immediately recognize a great many English words in written form; similarly, a literate English-speaker will already possess a passive command of a substantial Spanish vocabulary in written form. If bilingual programs teach Spanish-speakers to read and write Spanish, there will be considerable transfer of content as well as of basic skills, not to mention the fact that certain English roots of Latin origin of no inherent meaning to monolingual English-speakers are immediately meaningful to literate bilinguals: "inevitable" ("evitar") or "inexplicable" ("explicar"), for example.

Modern descriptive linguistics, which has generally gained ever-greater acceptance among language teachers of all types in recent years, considers oral language to be the basic or essential form of human communication on theoretical grounds and, therefore, posits the marked advantages of oral language instruction. In the face of the Latin Link of a largely written nature discussed previously, heavily oral instruction in any of the cases mentioned previously is doomed to be much less effective than instruction that stresses writing. This is not to say that oral language should not be taught, but rather that it be taught in conjunction with the writing system.

Although specifically beyond the scope of this paper, the very same principle could be expected to hold for foreign-language instruction in any romance language, or German, for reasons that may be readily inferred. In fact, this principle may largely explain the debacle of audio-lingual instruction in recent years.

G.K. Green, Pan American University at Brownsville

NOTES

[1] Ramón Menéndez Pidal. *Manual de gramática histórica española*. Madrid: Espasa-Calpe, 1959, p. 9.

[2] Albert C. Baugh and Thomas Cable. *A History of the English Language*. New Jersey:Prentice-Hall, 1978, p. 9.

[3] Arnoldo Harrington. *Diccionario médico*, *inglés-español/español-inglés*. Buenos Aires: Del Atlántico, 1960.

[4] Study personally carried out by G.K. Green, unaided, in October of 1985.

[5] Otto Jespersen. *Growth and Structure of the English Language*. New York: Doubleday, 1955, p. 107.

[6] G.K. Green. *Manual de fonología española*. Brownsville:PAUB, 1985, pp. 104-105.

PREPARING MINORITY STUDENTS FOR COLLEGIATE STUDY: A SUGGESTED HIGH SCHOOL-COLLEGE TRANSITION PROGRAM

by

Herbert K. Heger and Terry Salinger

The University of Texas at El Paso

The objective of this presentation is to encourage faculty to begin to consider how to respond to the needs of minority students during a period in which academic standards are being raised. As 1986 begins it is clear that universities are under considerable pressure to improve standards in the basic skills area, as well as in other academic areas. Generally, university faculty and administrators tend to agree with the social need for higher standards, but are concerned with the problem of implementing improvements without creating counter-productive effects. This concern is especially important to those faculty who deal with minority students.

This paper will argue that any improvement in basic skills standards must be accompanied by a redefinition of the process of selecting and inducting students, especially minority students. Another way of expressing this is that the traditional "sink or swim", or "I dare you to you find the study skills center" approach, will no longer suffice. The first part of the paper will review the reasons for our conviction that a new approach is needed. The second part of the paper will consist of a set of working notes that outline the authors' current thinking about how one campus should respond to the challenge of higher basic skills standards. Perhaps these notes will give you some ideas about how your campus can better serve minority students.

Background on The University of Texas at El Paso Situation

As might be expected from its location, The University of Texas at El Paso serves a multicultural population. 51% of its students are Hispanic, including many students who received most or all of their pre-collegiate education in Mexico. Hence, many students lack customary basic skills.

In Spring of 1984, it became mandatory for students desiring to enter teacher education to pass the Pre Professional Skills Test, a test of reading, writing and mathematics skills. This requirement was implemented as part of a state-wide reform in teacher education. Since that time, Governor Mark White has appointed a blue ribbon commission to study and propose reforms in higher education. As might be expected, "reforms" have been pre-defined to mean higher standards. Not to be outdone, the Higher Education Coordinating Board has begun its own study of reforms, to include a "rising junior test." A "rising junior test" is a basic skills test that a student must pass before being promoted to junior status. There is a reasonable chance that the P-PST will be adopted for this new function. But, the P-PST is difficult for minority students to pass. The experience of the UTEP College of Education is instructive in this regard.

UTEP Data on the Impact of the P-PST

The data presented here is based on 1984-85 data, the first full year affected by the P-PST. The Pre-Professional Skills Test (P-PST) is a criterion referenced test of reading, writing and mathematical reasoning skills developed by the Educational Testing Service of Princeton, New Jersey. The test assesses the type of skills one would expect to be common among current high school students by the time of graduation. The authors of this paper have examined samples of the P-PST and are on the ETS team which is preparing a P-PST preparation manual. As a result of this experience they have concluded that the content assessed by the test is valid, but harder for students than policy makers expect.

The problem is that too few college students are passing the test. In the March 1985, Texas administration of the P-PST, only 60% of all students passed all three parts of the test. In the case of white students, 67% passed all three sections of the test. The success rate on all three sections of the test was only 22% percent for Black students and 32% for Hispanic students.(Texas Education Agency, 1985) Obviously, such low rates of success raise questions of candidate quality, program equity and have implications for university enrollment.

The subjects were students who were admitted to teacher education program at The University of Texas at El Paso(UTEP) between September 1, 1984 and August 31, 1985. The study was limited to elementary certification candidates; all-level and secondary candidates were too few in number to provide a trustworthy sample group.

There were only 73 candidates admitted to elementary education at UTEP during the period in question. Previously, more than 200 persons per year were admitted to elementary education. (It should be noted that some of this decline can be blamed on factors other than the P-PST requirement.) There were 34 students who began as Freshmen at UTEP, 26 persons who transferred from the community college and 13 persons who already held a B.A. degree. The population was 39.7% Hispanic, down from 55% in 1981. The population was 84.9% female. 63% of the students will be over 25 by their normal anticipated graduation in 1986: They are an older population than in previous years.

Table One shows candidate age at probable graduation. The reason for the selection of this criterion is complex. Non-traditional students are generally considered to be students who are over 25 at admission to college. Some of these people began college at age 18 and dropped out. Some are part time students who progress slowly. Others began college at an older age. Hence, the date of first admission to college is not helpful with non-traditional students. Admission to teacher education is not much more helpful since such admission can vary from the completion of 60 semester hours to a point very close to completion of all program requirements except for the professional education course block. Further, prior to 1984, many elementary education methods courses may have been completed prior to admission. Hence, age at admission to teacher education

Table One:
Demographic Characteristics of Admitted UTEP Teacher Education Candidates, 1984-85

	Number	%
Students Admitted	73	
Anglos	44	60.3
Hispanics	28	38.4
Unknown	1	1.4
Female	62	84.9
Male	11	15.1
All credits from UTEP	34	46.6
Community college transfer	26	35.6
Held a B.A. at admission	13	17.8
Traditional age	19	26.0
Older than traditional	26	35.6
Much older than traditional	20	27.4
Unknown age	2	2.7

(Note: Percentages may not total 100% due to rounding.)

is not a stable factor. Therefore, for the purposes of this study, it was decided to consider student's age at probable program completion. Since persons admitted in 1984-85 are likely to complete the program in 1986, traditional students were defined as those who would not turn 25 until after an anticipated 1986 graduation (e.g. born 1962 or later). Students in the next category were those who would be 25 through 34 at 1986 graduation (e.g. born 1952-61). Students born in 1951 or earlier were considered in the "much older than traditional" group.

Table Two:
The UTEP Hispanic Education Enrollment Trend

(Per cent of students declaring themselves in the following categories)

	1978	1979	1980	1981	1982	1983	1984
Elem. Educ.	45.7%	51.0%	52.1%	55.2%	NA	NA	39.7%*
UTEP	NA	NA	42.0%	43.0%	42.6%	45.5%	47.3%

Source: UTEP Office of Institutional Studies
Note: A direct hand count of admitted teacher education candidates for 1984 indicated that 38.4% are Hispanic.

Table Two shows the trend in Hispanic enrollments at UTEP and in the university's teacher education program. The P-PST requirement depressed Hispanic enrollment in percentage terms in 1984. However, there was a dramatic drop in first time admissions among Anglos as well as Hispanics. Since past variations in teacher education admission practice prevent a direct count of teacher education enrollment in a particular year to be compared to other years, Table Two consists of data collected by the registrar during registration on the basis of student self reporting.

(Note: Table Two is the only instance of this kind of data in the present study. All other data was obtained directly from certification files.)

Table Three shows the varied academic origin of teacher education students. When age and former educational experience is considered, the largest student subgroup is only 24.6% of the population.

Table Three:
Age vs Academic Background of UTEP Elmentary Education Students

	Number and percentage of students		
	UTEP Only	Community College	Degree Holder
Traditional Age	18 24.6%	5 6.8%	2 2.7%
Older	9 12.3%	10 13.7%	7 9.6%
Much Older	7 9.6%	9 12.3%	4 5.5%

Table Four:
Ethnicity vs Academic Background of UTEP Elementary Students

	Number and percentage of students		
	UTEP Only	Community College	Degree Holder
Hispanic	15 20.5%	11 15.0%	2 2.7%
Other	19 26.0%	15 20.5%	11 15.0%

A traditional indicator of student quality is SAT/ACT performance. Unfortunately such scores are unavailable or misleading at UTEP. UTEP requires a score on the SAT or ACT for traditional age beginning freshmen. Enforcement of this rule is rather lax. Older students do not have to provide a score at all. Neither are transfer students required to have SAT or ACT scores in order to gain admission. Consequently, the majority of teacher education students have been admitted without standardized test scores.

Another indicator of program quality would be the number of students who were required to remedial basic skill work in college. Here, the results are positive. Not a single candidate admitted during 1984-85 had to take the UTEP remedial English 3110. Similar data is not available on the community college transfer students.

If one assumes that the P-PST is a valid indicator of academic skills, one would expect that there would be a relationship between the P-PST scores and grades in freshman English. No such relationship was apparent. There appear to be too many variables involved in grading procedures to be able to isolate performance on the particular skills assessed by standardized tests. The relationships between grades in English 3112 and the P-PST and between Math 3302 grades and the P-PST is presented in the following tables. All three of these distributions do not vary from that which can be explained by chance.

Table Five:
P-PST Reading Section Scores vs ENG 3112 Grades

	A	B	C	D	F
185-190	4	2	0	0	0
178-184	6	10	4	0	0
172-177	4	5	6	0	0

n = 41; 3x3 chi square = 6.011037, df = 4, not significant

Table Six:
P-PST Writing Section Scores vs ENG 3112 Grades

	A	B	C	D	F
185-190	1	3	0	0	0
178-184	7	4	1	0	0
173-177	6	10	6	0	0

n = 38; 3x3 chi square = 5.709193, df = 4, not significant

Table Seven:
P-PST Mathematics Section Scores vs MATH 3302 Grades

	A	B	C	D	F
185-190	0	1	0	0	0
178-184	2	3	0	0	0
171-177	3	6	1	1	0

n = 17; 3x4 chi square = 1.916364, df = 6, not significant

Another traditional indicator of academic quality is the grade point average(g.p.a.) of students. If the P-PST is an indicator of academic quality, conventional thinking would suggest that there would be a positive correlation between P-PST scores and g.p.a. Therefore a correlation was calculated between P-PST composite scores and g.p.a. (Table Eight). The P-PST composite score was the total of the scores received on each of the three P-PST subtests in reading, writing and mathematics. Grade point average was the g.p.a. as calculated by the University of Texas at El Paso over courses taken at UTEP. Subjects included in this calclation were limited to those students who had taken all of their courses at UTEP.

Table Eight:
P-PST Composite Scores vs Grade Point Average

	P-PST Scores	g.p.a.	P-PST vs g.p.a. Pearson correlation
All Students	mean = 530.61	mean = 2.84	r = .11
n = 33	std.dev. = 10.2	std.dev. = 0.53	(not significant)
Anglos	mean = 530.35	mean = 2.89	r = .18
n = 17	std.dev. = 12.17	std.dev. = 0.61	(not significant)
Hispanics	mean = 528.14	mean = 2.79	r = -.07
n = 15	std.dev. = 7.88	std.dev. = 0.44	(not significant)

Note: One subject was of unidentifiable ethnicity. The small n of this sample was due to the small percentage of students who began as UTEP Freshmen.

There is clearly no correlation between g.p.a. and P-PST scores. On careful reflection it should not be surprising that there is no significant correlation between P-PST scores and academic performance indicators. The P-PST is a measure of basic skills that were taught in the past. The g.p.a.

includes a wide variety of grades awarded for all courses taken at UTEP, many of which do not require the application of basic skills. It is more likely that there would have been a relationship between the P-PST writing score and English 3112, a writing course, than between overall g.p.a. and P-PST score. It should also be noted, however, that the grade in a course like English 3112 also covers many variables beyond those assessed by the P-PST. So even there, any correlation would probably not be high.

Similarity Between Ethinic Groups in P-PST Performance and in Grade Point Average

The most surprising aspect of the statistics presented in Table Eight is the lack of difference between the ethnic groups on P-PST scores or g.p.a. This finding was unanticipated by the investigators. After all, nearly every study of basic skills test performance of the general population indicates that minorities do less well than Anglos. One would therefore expect that even among students who have passed the P-PST the Anglos would have a performance advantage.

The mean P-PST composite score for Anglos was 530.35 and 528.14 for Hispanics. No significant difference exists between these means (t = .2770751; df = 14). Equally surprising was the mean g.p.a. for Anglos of 2.89 and 2.79 for Hispanics. Again no significant difference was found (t = .8136805; df = 14).

Implications of the Data

Although the present sample is too small to make any final determination, it does seem that the P-PST as a screening agent successfully identifies Hispanic and Anglo students who are on comparable academic levels. Hence, at least for The University of Texas at El Paso, minority enrollment in teacher education may be dropping, but the quality of admitted minority students is now equal to the Anglo student population. That is a major accomplishment from a quality point of view.

However, the decline in minority admissions is very, very serious as shown in Table Two. In an era where the minority enrollment of the university is rising, the P-PST, if implemented in isolation, would reverse the trend. Several of us at UTEP have estimated that the P-PSt, if implemented on a campus wide basis, would result in a loss of over 30% of UTEP's undergraduate population. That raises issues ranging from equity, through impact on the community at large to job security for faculty.
The need to begin an innovative recruitment, selection, induction, refresher study and minority student support program is clear!

Bibliography

Educational Testing Service, (1982) "Pre Professional Skills Tests."

Educational Testing Service, (1984) "P-PST:Interpreting Scores on the Pre Professional Skills Tests of Reading, Writing, and Mathematics."

Garcia, P. (1985) "A study on teacher competency testing and test validity with implications for minorities and the results and implications of the use the the Pre Professional Skills Test (P-PST) as a screening device for entrance into teacher education programs in Texas." Final report, National Institute of Education grant number NIE-G-85-0004.

Texas Education Agency, (1985) "March 1985 Texas P-PST Administrations." Network for Teacher Competency Testing Newsletter, vol. 1, no. 1, pp. 5-8.

Texas Legislature 67th Session, (1981) "Senate Bill Number 50."

Texas Legislature Special Session, (1984) "House Bill Number 72."

DM1.1 DISK #3: TECHF

INVOLVING MEXICAN AMERICANS IN HIGHER EDUCATION: AN UNTAPPED POTENTIAL

by

Norma G. Hernandez and Jorge Descamps

The University of Texas at El Paso

INVOLVING MEXICAN AMERICANS IN HIGHER EDUCATION: AN UNTAPPED POTENTIAL

Norma G. Hernandez and Jorge A. Descamps
The University of Texas at El Paso

Higher education in the United States continues to be, as it has been in the past, a white, middle-class, male establishment. There are growing problems for this establishment, however: first, an alarming decrease in enrollment, which translates into insufficient resources to meet student needs; and second, a continued racial and ethnic minority group underrepresentation which generates genuine concern that gains made a scant fifteen years ago are being eroded. At this point in the development of colleges and universities in the nation, a strong argument can be made for increasing minority participation in higher education which could lead to a dramatic social change: that of converting higher education into a more culturally diverse establishment.

The need for the inclusion of minorities in higher education has been described in a five-part report of the Western Interstate Commission for Higher Education in Colorado. The proportion of college-age minority students in Arizona, California, Colorado and New Mexico will increase from a current 35% to nearly 45% by the year 2000. The most significant population increase will occur among Hispanics who will constitute nearly 40% of all minority children under age 5 at that time. The minorities will become a majority of college-age eligible students. Unless members of these groups become well educated, it will be difficult for the nation to maintain its position of world leadership in the next century. A number of institutions have already undergone an increase in minority enrollment, however heedless or unreceptive to the change. In some cases the change has come about grudgingly, ungracefully and unproductively. In most instances the white, middle-class, male dominated establishments have remained unchanged.

The purpose of this paper is to make recommendations for a sucessful approach to changing universities into pluralistic institutions. These proposals, however, will specifically address the case of Mexican Americans in the Southwest. The following recommendations are extrapolations from a review of research on factors affecting the academic achievement of Mexican American students. Over 500 research studies were reviewed by Hernandez and Descamps (1985) to identify factors that could account for this underachievement. The reviewers found, in general, three factors which influence the ability of Mexican Americans to profit from instruction as currently provided: a different language, a different economic situation and a different response to social and personal interactions. The recommendations, then, fall into the following categories: institutional plan of action, financial support, cultural and linguistic orientation, affective climate, and academic assistance.

Institutional Plan of Action

RECOMMENDATION 1: The institution will implement an affirmative plan of action insuring equal educational opportunity for all students. The plan will include the following: a) the development of an institutional statement of mission and goals by which the institution overtly commits itself to equity in education; b) the development of a sequence of check points by which to evaluate the implementation of stated goals, including timelines for achievement of recruiting and retention goals, as well as goals to increase the number of minority students graduating and receiving academic honors; c) the establishment of a process for monitoring the implementation of the planned activities; d) the appointment of an administrator, responsible to the president of the institution, for the implementation of this program, and e) the organization of advisory committees to the president made up by members of the Mexican American community.

Financial Support

RECOMMENDATION 2: Every effort must be exerted to provide financial assistance to capable Mexican American students in paying for tuition and books and in helping defray cost of living expenses. One of the most important factors in recruiting and retaining

Mexican Americans in higher education is financial assistance. For example, approximately one-third of all full-time California State University students depend upon financial assistance to meet their education expenses (Arciniega, 1986). Other southwestern institutions, in all probability, experience similar situations. As the number of Mexican American students desiring to participate in higher education increases, the amount of financial assistance must also increase. This assistance must come from the students' homes and/or outside sources, particularly the federal government.

Increased family support can come about if talented students are identified early in their schooling, and if they are given information relative to the forthcoming costs. Future students and their families can begin early programs of planning and saving through summer work. Additionally, they need information and assistance in obtaining scholarships and loans.

The primary source of student financial assistance in universities and community colleges is the federal government. Although families may increase their support by early planning this will not be sufficient. All efforts must be exerted to encourage continued federal assistance in terms of total aid, and in correcting inequities inherent in current methods of allocation. This support is essential in two ways: the first in making it possible for low-income students to attend college, the second in helping with living expenses to allow students to study without having to be employed. Talented students are often academically underprepared and need to devote to devote full time to study. Unfortunately, they burden themselves with part-time work to the detriment of their academic studies. The reality of their situation is: no work, no school. As a result students go through their course of studies in a part-time, erratic manner, often making decisions on the time it takes to complete a particular major, rather than on preference and ability. They become discouraged with the lack of relationship between hard work and good grades. The end result is more drop-outs without college degrees.

Cultural and Linguistic Orientation

RECOMMENDATION 3: Cultural and linguistic values held by Mexican Americans should be positively reflected in the educational environment. Greater numbers and proportions of Mexican American faculty must be appointed to make the academic environment reflect a pluralistic orientation. This is, perhaps, the most expeditious manner by which to achieve minority involvement. To date, however, it has been the least effective. Even in areas heavily populated by Mexican Americans there are very few tenured faculty members from this group. To meet this need and to address the excuse that a small number of minorities comprise the pool of available candidates with earned doctorates, bold university presidents and deans can encourage the appointment of talented Mexican Americans with advanced credentials stipulating that upon earning the doctorate their candidacy to tenured positions would be weighted heavily in their favor. Assignment and research support in their area of study would increase motivation to complete the doctorate.

Sensitivity toward the Hispanic culture is also expressed through the presence of related works of art, books, foods and festivities in the institution. In this manner the total environment reflects a bicultural and even multicultural orientation.

One significant obstacle for ethnic groups to reach mutual respect is the inability to communicate in their native languages. Acceptance of a person's or a group's language can be interpreted as acceptance of that person or group. An institution demonstrates acceptance of Spanish as being important when the administration, faculty and staff make efforts to communicate in that language in unofficial and official settings. A major goal for educational institutions in the Southwest should be to become bilingual academic communities to the highest extent possible. The importance of reading and writing in a second language can not be underestimated in an academic setting. This ability has always been one of the marks of an educated person. Furthermore, the proximity to the Mexican border and other Latin American countries offers a unique opportunity to conduct research in an international scope.

As the administration, faculty and staff increase their ability to use Spanish in academic life, students who have rudimentary and/or advanced skills in Spanish become important elements of that environment, thereby receiving support and encouragement. Spanish-speaking Mexican American faculty also become assets. For example, institutions in the Southwest should be able to award bilingual degrees in the social sciences, and very importantly, in the technical and medical sciences. They have the potential of becoming a major source of advanced technical training for a large portion of the Third World.

Affective Climate

RECOMMENDATION 4: A climate characterized by warm, personalized interactions with special attention given to the learning style of Mexican Americans must permeate the institution. Mexican American students succeed to a greater extent in an environment that is supportive to their efforts to grow and develop. Such a climate is one that is sensitive to their cultural values, their sense of worth and their language. Overt efforts must be made to help Mexican Americans and Anglos become better acquainted with each other's points of view without labeling either as "right" or "wrong". Many of these value differences are just a matter of emphasis rather than opposites. For example, Mexican Americans have a stronger family orientation than Anglos, or prefer cooperative efforts to competitive ones, or seek personalization and oral communication. A supportive climate makes possible for these preferences to be practiced not only in social exchanges but also in academic settings.

Courses that deal with historical, cultural and linguistic characteristics of the Southwest and the rich contribution made by the various ethnic groups that have populated it can be offered for academic credit. These courses should become a part of the academic program helping graduates become effective citizens of the region and the nation. Graduates of these institutions should be prepared to work with clients from various ethnic and linguistic groups. This training can be done most effectively in a university setting that is itself sensitive and responsive to cultural pluralism.

The Mexican American community is not involved in any aspect of higher education life, to a large extent, except as it might provide an untrained, non-professional, unskilled work force at the lowest levels of compensation. A positive affective climate requires the presence of "significant others" in positions of responsibility and in committees. Talented community representatives must be invited to participate in the major functions and work of the institution.

Academic Assistance

RECOMMENDATION 5: A strong assistance program must be facilitated to help school districts decrease the underachievement of Mexican American students so they may fulfill high school academic requirements and enter college. Because, in general, Mexican American students come to higher education as underachievers in English and Mathematics, specific steps must be taken to correct these deficiencies: a) universities need to prepare talented teachers of minority students who will help them succeed in all areas of the curriculum, b) teachers in elementary and secondary schools should receive university inservice training in methodologies to teach the basic subjects to minorities, c) school counselors must receive university training in developing skills to guide minority students toward college careers, and d) recruitment strategies that simultaneously articulate the entrance of students from high school into four-year institutions or community colleges are to be developed. In particular, for students entering universities, prior positive experiences in the college campus will have many long-range effects. For example, summer programs in academic and cultural events, academic year programs that allow higher education faculty to teach courses on high school campuses or students taking college courses for dual credit will predispose students to pursue a college career.

RECOMMENDATION 6: Colleges and universities must create strong assistance programs to insure the success of Mexican American students in higher education. Freshman and sophomore English and Spanish requirements need to be modified to help minority students achieve the stated objectives of courses requiring English reading and writing skills. This recommendation should not be misunderstood to be a plea for reduced requirements. On the contrary, it is a plan to help Mexican Americans to acquire comparable skills but through a different path. For example, an entry level English skills test is administered at the freshman level. Mexican Americans scoring low in English should then be administered a Spanish skills test. Those scoring low in both English and Spanish should be assigned to a freshman English section and a Spanish section to be taken simultaneously with the explicit purpose of having the student develop overall language competence.

Freshman classes in mathematics need to be small, between 20 and 25, and highly structured. The specific course objectives, published prior to the beginning of class, must state submission dates for assignments. Continuous feedback to students on their progress, and opportunities to apply mathematics to other areas of the curriculum through extensive work in problem solving, must be provided.

A study skills and tutorial program must be made available for minority students. Academic counselors will refer students to these services as needed. These tutorials should be overtly encouraged by faculty and conducted by Mexican American tutors as much as possible. Modification of course withdrawal policies is necessary to avoid early failure on the part of Mexican American students. Late deadlines to withdraw from courses without failing must be allowed. Finally, a strong counseling program to assist students in making career and personal decisions must be made available.

This paper has presented recommendations to change public higher education into culturally pluralistic establishments reflecting their constituencies. A fair and democratic concept, long overdue and difficult to attain. The recommendations presented through the case of the Mexican Americans in the Southwest apply to other minorities as well.

BIBLIOGRAPHY

Arvizu, S.F. and Arciniega, T.A. What Colleges Must Do to Achieve Quality and Equity: A Campus-Based Case Study. In Educational Standards, Testing and Access. Educational Testing Service Invitational Conference, New York, October 29, 1984.

Heger, H.K. Supporting Excellence Through Teacher Expectations. College Student Journal, 1984, 18(4)

Hernandez, N.G. and Descamps, J.A. Factors Affecting the Achievement of Mexican Americans. Bilingual Education Paper Series, 1985. Los Angeles: National Dissemination and Assessment Center, California State University, Los Angeles.

Hispanics in Higher Education: A CSU Imperative. Final Report of the Commission on Hispanic Underrepresentation, Tomas A. Arciniega, Chair, 1985. California State University, Long Beach.

MORAL EDUCATION IN A MULTI-CULTURAL SETTING

by

John H. Hummel and J. David Fairbanks
University of Houston-Downtown

Moral Education In a Multi-Cultural Setting

John H. Hummel and J. David Fairbanks,
University of Houston-Downtown

During the past year several national reports have critically examined public education at both the pre-college and collegiate levels. These reports have identified weaknesses concerning academic content, curriculum, and student abilities, and made recommendations designed to alleviate noted deficiencies. While most scholarly and media attention has centered on educational concerns, such as lack of achievement in basic skills, there has also been, concurrently, an increasing controversy about the role that values-and morals-training should play in America's schools and universities.

This paper will address several related issues concerning moral training as the concept relates to the multi-cultural undergraduate curriculum. We will (a) examine the historic tradition that morality has always played in education in Western society; (b) describe the major models of morality; (c) discuss why the "values clarification" approach that replaced the traditional views of moral education during the 1960s is conceptually inappropriate; and (d) identify issues which need to be addressed in order for colleges and universities to regain their proper role in promoting the values of Western civilization within a multi-cultural and pluralistic environ, the university.

Moral Education Training as an Historical Tradition

Perhaps the greatest problem one encounters when attempting discourse on the validity of moral training in education results from semantic misunderstandings. We live in a pluralistic country founded upon the principles in the Constitution that reflects the basic tenets of Western civilization. Interpretations of these principles are frequently cited by the opposing ends of various continuums. For example, both politically liberal and conservative individuals will cite the precept of separation of church and state to support their contrary positions on prayer in schools! This is possible because each faction uses "persuasive definitions" which occurs when "Selected conditions are linked with a recommending type of word and by this indirect method certain policies or ways of life are given the stamp of approval" (Peters, 1979).

William Honig, Superintendent of Public Instruction for California and a staunch supporter of using public education as a vehicle for moral education, believes that there is a divergence between those wanting prayer in schools and those who view moral training as basic to the concept of education. To avoid the potential conflict of different connotations associated with moral education and values education, it must be understood that moral training is not a subterfuge for religious education and probably never has been in American higher education. Sloan's (1979) analysis of colleges in this country in the nineteenth century suggests that while many early colleges in this country had names associated with religious bodies, they were not narrow sectarian institutions. Instead, they were usually supported by communities and were responsive to the needs of the community. Additionally, "the early colleges had a national orientation. They were seen as part of a larger movement to shape the wider society and to provide common national goals and values" (p. 194).

Western civilization is replete with examples of the tradition of moral training being intertwined with, and a necessary part of, education. Plato's Republic was cited by John Dewey (1916) as a type of teaching that holds that people do evil only because of their ignorance of what is good or moral. Then, as now, this position was criticized since knowledge, by itself, does not insure that one will conduct himself correctly. Instead, as Aristotle pointed out, moral conduct requires theoretical knowledge accompanied by relevant practical experience in order to know what to do.

In the modern era, romantic assumptions about human nature called into question the need for formal moral training for the young. Rousseau believed that children should not use their reasoning abilities until they were fully developed and, accordingly, argued against efforts at teaching morals. Instead, he advocated that a child's tutor should adhere strictly to teaching neutral content (eg., Plato's knowledge) while providing a good model of conduct. For Rousseau, children were born good and will remain virtuous (and exhibit moral conduct) as adults if society does not taint them while they are learning during their childhood and youth.

The history of American education's perspectives of moral education contrasts sharply with France's Rousseau and is similar to that associated with the educational philosophy of England's Joseph Lancaster. Public education in both England and the United States developed as a form of economic and social control and reflected a belief that humans were born either morally/spiritually corrupt or morally neutral. In the former, the child must, through moral education, overcome his base nature, while the latter position also required moral training if one were ever to become moral. (Without moral education an amoral child would invariably become tainted.)

Public education for the masses is credited to progressives who stressed that the ruling classes should educate the lower classes for the following reasons. First (and the more important for the upper class), to maintain the status quo in a world in which social and political revolutions were becoming common, the masses would have to be taught conduct. This moral training would teach them their rightful place in society and provide for social stability while simultaneously providing an infrastructure for aculturation and the opportunity for upward mobility which was part of our democratic creed. Also, the industrial revolution was requiring that the working classes be more adaptive to continuing changes required in their jobs. Lancaster and his American contemporaries viewed schooling as the means to produce economic change without concomittant radical social changes (eg., economic change with evolutionary social change).

Carnoy (1974) interprets the educational reform efforts occurring in the United States between 1849-1920 as an outgrowth resulting from the economic conversion of society from agrarian to industrial. Dewey's (1916) views on moral education, to a degree, parallels those of Carnoy. The distinction between them centers on political motivators. Carnoy viewed the educational reform efforts primarily as an attempt by the upper classes to maintain their power base (social control) over the working class(es). Dewey, though, viewed moral training as a necessary part of the democratic process and that socialization into the "American Way" was a critical goal for education to meet.

Moral Education From the 1960s to the Present

The decade of the '60s was one of the most traumatic ever experienced by this country. Characterized by the sexual revolution, racial unrest and civil rights reforms; increased interest in the women's movement; increased experimentation with drugs, and the development of a "counter-culture" movement typified by a rejection of the "work-ethic" and an accelerated fixation with "me", while obsessed with making everything-especially education-relevant, all contributed to a rapid decline in moral education. Collaterally, we suspect that part of the rejection was in reaction to efforts to politicize education; many wanted to keep the passion and moral fervor inflamed by civil rights and Vietnam out of the classroom.

While little of moral training during the twentieth century ever focused on absolutes, the 1960s so diffused the education system that even formerly fundamental ethics became debateable issues. Part of the educational changes that began in the 1960s involved humanistic philosophy and America' concomittant acceptance of the "open-concept" in public education.

As the philosophies presented earlier indicated, moral education had always required a firm knowledge foundation upon which one could then base moral conduct; but the conduct was originally taught through processes such as modeling (general societal agreement on what was acceptable and unacceptable at the macrolevel; observing teachers, parents and significant others at the micro or individual level), rewards and punishments.

Concurrently, perhaps only in a correlative sense, Jean Piaget, a French psychologist, had developed descriptive theories of both cognitive and moral development that were interrelated. Both theories involved stages (the former four, the latter three) characterized by what the child could do (performance) and understand at various ages. One premise of Piaget's cognitive theory was that discovery learning (which involved a child discovering for himself relationships between events at a stage when he was capable of understanding the particular concept) would be more meaningful than structured performance generated by drill, reinforcement, etc. Thus, this relatively minor piece of Piaget's complex theory became a rallying point for instructional pedagogies, other cognitively-oriented theories and the concept of open-education.

Piaget's theory of morality also became noteworthy because it served as a starting point for Lawrence Kohlberg's (1964) cognitive theory of moral development. Essentially, Kohlberg's theory meshed Freud's psychoanalytic systems (ego and the superego's conscience) with Piaget's cognitive-based views on moral reasoning. The result is three levels of sequential moral reasoning with each level having two substages or types.

In the premoral stage (Level one), children first learn conduct as a result of punishment and their obedience orientation. In the second type of Level one, the child learns to behave in a particular way to both obtain material rewards and to avoid punishment for inappropriate behavior. In the second stage or level of moral development (conventional), social relations determine behavior (type three), so the child does what will result in approval (social rewards) by significant others. In type four of level two, the child is concerned with conformity to authority (rules are important). At the final level (morality in terms of self-accepted principles, or postconventional), "the child begins to view morality in terms of individual rights (Type 5), and as ideals and principles that have value as rules or laws, apart from their influence on approval. The person's individual notions of right and wrong (Type 6) begin to take precedence" (LeFrancois, 1977, p. 315).

Values-Clarification and Kohlberg's Levels of Morality

Essentially, Kohlberg's description of postconventional moral reasoning is that each person's conduct is a product of both their progress through levels one and two and their developed mental faculties. Thus, Kohlberg's stage theory is complementary to the positions of Plato and Aristotle, Rousseau and Dewey. The problem is that his theory, when applied to public education, was misapplied, possibly because it was misunderstood.

As noted earlier, the 1960s and 1970s were a socially and academically turbulent period. Educational standards were eroded, student achievement declined and curricula were softened. Correlated with these changes was a decline in traditional moral education accompanied by an increase in what is known as values-clarification. Values-clarification originally was associated with humanistic non-directive psychological therapy methods. Professional therapists adopted a non-judgemental position, within the confines of the therapeutic setting, to better understand and help their patients. As open-education concepts gained momentum, it became almost inevitable for public school counselors and teachers to adopt this approach as a replacement for the traditional approach for moral training.

Unfortunately, non-directive therapies tied neatly only with Kohlberg's post-conventional level. Levels one and two, which reflected precepts of traditional moral education, were not recognized as critical to the success of post-conventional applications. As Coleman (1985) and LeFrancois (1977) have indicated, the different levels not only are complementary but necessary. Specifically, Kohlberg's stages are sequential and cumulative rather than age-related. One must progress through levels one and two before one can exhibit the rule-governed reasoning necessary for level three. Public schools and universities warmly welcomed the values-clarification position identified with the post-conventional level, while failing to realized that the technique (values-clarification) was originally designed for highly verbal (eg., educated) adults.

While college students are adults, many who attend public institutions have not progressed through Kohlberg's first and second levels and are unable to exhibit the caliber of moral reasoning (associated with Piaget's formal stage of cognitive development) necessary for post-conventional conduct.

Today's University and Morals training

Colleges, during the past 75-years, have dealt with both general education issues and values with cyclic regularity (Sloan, 1979). Several new reports by individuals (Bennett, 1984; Astin, 1985) and groups (Association of American Colleges, 1985; National Institute of Education, 1984) have focused on identifying current problems in higher education. Among the recommendations proffered in the reports is an increased emphasis on the arts and humanities as general education requirements.

In an analysis of nationally-prominent reports on higher education, Fairbanks and Hummel (1985) noted that morals/ethics training was a penultimate theme through all of these reports. While reluctant to endorse specific approaches to values education, all of the reports indicate the necessity for each college to examine the values inherent in their programs and courses that underlie the educational experiences of students.

Colleges should initiate campus-wide discussions to clarify and state the institution's values and the core ethics students should possess at the end of their studies. A starting point for these discussions could include the basic values of the West that were codified by the Conference on the Atlantic Community in 1957. These are: "(1) Respect for the intrinsic values of the human person; (2) inseparability of freedom from moral responsibility; (3) inseparability of freedom from human solidarity; (4) tolerance; (5) recognition that these principles are global; and (6) the need for continual self-examination, demonstration and incorporation of these principles in institutions" (Bieri, et al., 1962).

References

Association of American colleges, Integrity in the College Curriculum: A Report to the Academic Community, February, 1985.

Astin, A Involvement: The Cornerstone of excellence, Change, XVII, 1985.

Bennett, W.J. To reclaim a legacy: A report on the humanistics in higher education. National Endowment for the Humanities:. Washington, D.C., 1984.

Bieri, E., et al. Final report of the Commission on religious and spiritual values of the conference on Atlantic community. In, Basic values of the Atlantic community, 1962, London: Pall Mall Press, Ltd.

Carnoy, M. Education As Cultural Imperialism. David McKay Co., Inc.: New York, 1974.

Coleman, M.D. The university and values education: Implication of Kohlberg and Frankel. AGLS Perspectives, 15, 1985, pp. 20-28.

Dewey, J. Democracy and Education. The Free Pren: New York, 1916.

Honig, W. Last Chance For Our Children, 1985...

Kohlberg, L. Development of Moral character and moral ideology. M.L. Hoffmann and L.W. Hoffmann (eds.). Review of Child Development Research. Vol. I. New York.: Russell Sage Foundation, 1964, 383-432.

LeFrancois, G.R. Of Children: An introduction to child development, 2nd ed. Belmont, CA.: Wadsworth, 1977.

National Institute of Education. Involvement in learning: Realizing the potential of American higher education, 1984.

Peters, R.S. (1979). Democratic values and educational aims. In D. Sloan (Ed.), Education and values (pp. 67-86). New York: Teachers College Press.

Sloan, D. (1979). The teaching of ethics in the American undergraduate curriculum, 1876-1976. In D. Sloan (Ed.), Education and values (pp. 191-254). New York: Teachers College Press.

HIGHER EDUCATION GOVERNANCE IN YUGOSLAVIA: A CROSS-CULTURAL PERSPECTIVE

by

Robin T. Peterson

New Mexico State University

HIGHER EDUCATION GOVERNANCE IN YUGOSLAVIA: A CROSS-CULTURAL PERSPECTIVE

Introduction

Even a casual examination of Yugoslav Universities and their component colleges (faculties) reveals that they are similar in many ways to their counterparts in the United States. Many arts, sciences, engineering and business curricula, for instance, do not differ substantially from common modes in the United States. On the other hand there are significant differences, especially in the field of university governance. In turn, some of the more evident and far-reaching differences are reflected in three areas: (1) physical facilities, (2) internal relations, and (3) external relations.

Physical Facilities

At present, Yugoslavia has seven Universities, 17 advanced schools (of University rank), 14 academies for the arts, and 139 higher school (teacher training colleges, commercial colleges, etc.). One measure of size - the average number of annual graduates - approximates 18,000 - in a country whose population is roughly twenty-one million. It is evident, based upon this magnitude alone, that public policy dictates a high priority for institutions of higher education. Few other nations in Eastern and Western Europe make higher education facilities and resources available for such a high percentage of their citizens.

The Yugoslav University is similar to its West-European counterpart, in that commonly, each faculty (college) is housed in a separate site (building or complex of buildings). Often, the separate faculties are geographically dispersed. Thus, at the University of Nis, the Faculty of

Philosophy and the Faculty of Medicine are situated in opposite ends of the city, while the Faculty of Economics (including both business and economics) is located at a point in between these two. Interestingly, the geographic dispersion has not created severe problems of university coordination since each faculty operates in what is essentially an independent manner. In fact, most administrators are of the opinion that closer physical proximity would have only a minimal impact on the operations and success of the separate faculties.

In the main, physical facilities at Yugoslav faculties are well-developed and maintained, despite the fact that this is not an affluent nation. Many of the buildings are relatively new and witness modern architectural patterns and contain up to date furniture, fixtures, and equipment. Where older buildings are used they tend to be in a state of good repair. Mixtures of traditional and modern facilities are evident at some institutions, of course. An example is the University of Sarajevo, where the administration has attempted to construct buildings and classrooms that reflect traditional cultures, in a setting that includes a number of older buildings.

External Relations

Individual faculties carry out official communications with each other, when this is necessary, through the office of the President of the University. The latter has very limited authority, with no substantial voice in such matters as allocations of funds to faculties, recruiting and selection of instructors, curriculum, and faculty organization. Rather, he or she coordinates the loose confederation of individual faculties, attempts to resolve differences between them, serves as a liaison with governmental officials, represents the University at large in dealing with outside agencies such as the press, and is involved in undertaking University public relations work. Contacts between individual Faculties and the President are maintained by the Deans of the faculties, much in the same manner as in the United States.

Some all - University committees are "public relations" and "overall planning," which attempts to formulate University mission strategies, and policies. Each faculty elects one or more representatives to such bodies. The latter operate in an advisory capacity, only, and are not viewed by professors as sources of substantial power. In fact, many professors vigorously avoid election to all - University committees - viewing them as unproductive and unduly time consuming.

In some cities, such as Titograd, the individual faculties have not united into a University. Rather, each operates entirely as a separate institution - devoid even of the loose confederation arrangement described above. Experience has indicated to the Yugoslavs that such an arrangement allows the faculty to develop its curriculum, physical facilities, and other structures in an autonomous manner that is absolutely unhindered by many of the problems which all - university structures in other nations impose.

Internal Relations

Internal (within the faculty) relations are very important, since, in essence, each faculty is a powerful and independent entity - with the power to withdraw from the University, if desired by a majority of the staff. In addition, the disciplines represented in each Faculty are heterogeneous, posing threats of internal faculty strife, should the atmosphere not be composed of striving toward common goals and internal cooperation. Further, the Faculty has the authority to conduct numerous activities and make decisions that are entrusted to top level administrators in the United States college and Universities.

As in the United States, deans head each Faculty. However, in Yugoslavia the individual deans' power and authority is considerably less than in this country. Basically, their duties involve representing the faculty in contacts with other institutions and government agencies, implementing policies adopted by the Faculty, presiding over meetings, and proposing plans, policies, and procedures - which the faculty can readily accept or reject. Many individuals hold their dean status for only very limited (1-2 year) periods of time. Competition among Faculty for deans positions is seldom intense. In fact, some Faculties have experienced difficulty in generating sufficient numbers of candidates for deans positions, to satisfy their recruiting goals.

Decisions such as those involving capital budgeting, allocating Faculty positions to colleges, curriculum modification, promotions, and pay increases are made by a council made up of all professors in the Faculty. It is said that no one individual (including the dean) exercises institutionally imposed power - the source of power is in the group. Even decisions such as which students are to receive teaching and research assistant ships are made by the Faculty at large, after prolonged deliberation.

With respect to course offerings, each Faculty is self-contained, that is, students enrolled in one Faculty take all of their courses there. Thus, a Faculty of economics includes professors of mathematics, foreign language, humanities, social sciences, and physical science, in addition to economics. This arrangement is a natural consequence of the desire to operate each Faculty in an autonomous manner. The concept of all-university service courses has not been implemented, as it has in the United

States. Autonomy is preferred, even though it results in considerable duplication of disciplines across Faculties.

Each Faculty receives its budget allocation in a lump sum on an annual basis from governmental authorities. The allocation of funds to various end uses such as salaries, capital equipment, supplies, etc., is undertaken by the council of professors. These individuals, acting as a group have the power to grant increases in salary to some or all professors at the expense of reduced funding for capital, or vice-versa. The budget, then, is very flexible - certainly not line - item. The source of funds is in the provincial (state) government, rather than Belgrade, reflecting the desire of Yugoslavs to decentralize decision making as much as national policy permits. Other East European countries tend to allocate budgets at a central level - as is the case in Bulgaria and Romania.

As was mentioned earlier, the selection of new professors is undertaken by the Faculty council and is a very comprehensive process mainly focusing on research and publishing potential and output. The council also evaluates the progress of each existing instructor every five years. Again, the evaluation emphasizes research and writing, rather than teaching and service accomplishments. The evaluation can lead to promotion, demotion, maintenance of status quo or dismissal. In the main, heavy reliance is placed upon the referred journal and book publishing record of the professor. Student evaluations of professors are not utilized, although some institutions are experimenting with student and peer evaluations of teaching. The most widely used teaching effectiveness evaluation device is to monitor student performance on comprehensive final examinations.

As compared to the United States - teaching loads in Yugoslav Faculties are not heavy - most professors teach 3, and a few 6, hours per week. Normally classes (called lectures) are held on a one day per week on a 3 hour session basis. Frequently, professors rely upon guest lecturers from other Universities and from governmental or business organizations.

Evaluation

Certainly higher education processes and institutions in Yugoslavia differ from those in the United States, in many respects. Yugoslav professors, in general, disagree regarding the effectiveness and efficiency of the group (council) decision making process. Most regard this activity as a valuable mechanism for the maintenance of self governance and the avoidnce of arbitrary and self seeking one person or elitist group rule. Yet, many grow weary of and disenchanted with the frequent council meetings - which sometimes consume as much as 16 hours per week. This time drain, of course, is partially offset by the moderate teaching loads. The latter are defended on the basis of quality - many Yugoslav professors cannot imagine quality teaching when professors have 9 or 12 hour teaching loads - as in numerous schools in the United States.

Since each Faculty is self contained, some duplication of personnel in various disciplines exists. Thus each Faculty in the University employs instructors in basic fields - foreign language, social science, etc., in addition to specialists in its own discipline. The rationale for the duplication is that it permits Faculty to specialize - to orient their teaching efforts to the specific needs of students enrolled in that particular Faculty. Hence, a mathematics teacher situated in the Faculty of Economics tends to orient his or her teaching toward the solution of problems confronting business, while his or her counterpart in the Faculty of Science is more likely to focus upon theorems and proofs. The autonomous operation of the Faculties, then, tends to increase total costs because of duplication of disciplines, but does permit each Faculty to specialize in serving its parent discipline.

The major output of the system of higher education - the graduates - are believed by most Yugoslav authorities and educators in other countries to be high in quality. Indeed, some schools, as in medicine, have reputations that permit them to draw numerous students from other countries, including developed nations. Conversely, graduates in various fields, such as economics and the physical sciences, have a background of knowledge judged to be adequate but several years behind those of neighboring Austria, West Germany, and Switzerland. Overall, Yugoslav graduates are reasonably successful in competing for the more attractive positions in international business firms.

The research output of Yugoslav professors is substantial and growing at an impressive pace. Much of the creative activity is devoted to writing textbooks, as this is heavily rewarded by the administration. This orientation probably inhibits the production of conference papers, manuscripts for referred journals, and grant proposals. Nevertheless, Yugoslav professors have an impressive record of scholarly works, both in journals published in the country and those emanating elsewhere. It appears that the textbook bias has not severely inhibited scholarly research endeavors.

Yugoslav professors devote much of their service efforts to attendance at Faculty meetings. These consume substantial volumes of time, meaning that professors cannot engage in what United States professors commonly call service work. Hence, service is not a strongpoint of the Yugoslav system.

The low teaching loads of Faculty members has essentially been compensated for by increasing class sizes above levels that might be considered as optimal. Administrators faced with the need to keep teaching loads small, in accordance with established procedures have raised class-size limits on a steady basis, as enrollments have grown over the past decade. The result according to most observers has been a decline in the quality of instruction. The administrators have, however, resisted the temptation to assign classes to teaching assistants, as many United States schools have. To the contrary, Yugoslav classes are taught only by professors.

In general, the morale of professors at the University is high. Substantial turnover, and absenteism are not in evidence. Professors receive an income that is well above the national average for managerial and professional positions. Further, their prestige and social status is on a high plane, as higher education is held in substantial respect in the country. Many instructors evidence an opinion that they are accomplishing worthwhile work and are contributing to the needs of their country and province, suggesting that they are accomplishing self actualization needs.

THE ODD COUPLE: HOW WE TEACH AND HOW THEY LEARN

by

Ronald Shook

Utah State University

The Odd Couple: How We Teach and How They Learn

Ronald Shook

Utah State University

In 1949, Gilbert Ryle suggested two types of knowledge. He called the first "knowing that," and the second "knowing how." Knowing the rules of logic is knowing that, and being able to reason is knowing how. Knowing what an undistributed middle is seems to be more important to us than being able to avoid one.

In 1958, Michael Polanyi suggested two types of knowledge. He called the first "explicit," and the second "tacit." Explicit knowledge is that knowledge we can readily call to mind, that we can discuss. Tacit knowledge, on the other hand, is knowledge that shows itself more in doing than in saying. Recognition of faces is tacit; describing faces is explicit.

In 1982, Douglas Hofsteder suggested two types of knowledge. He called the first "declarative," and the second "procedural." Declarative knowledge is knowledge that we have stored somewhere in memory. Procedural knowledge exists as a set of routines and subroutines in the mind which, when done in sequence, result in an act, though the act may not necessarily be physical.

Are these scholars trying to tell us something? I believe so. Though there is some difference in the way each approaches the subject, it seems clear that Ryle, Polanyi,and Hofsteder are describing the same phenomenon: two types of knowing -- one verbal, retrievable, discussible, stored intact in the mind; the other non-verbal, non-retrievable, mute, scattered all over the mind. One is display; one performance.

My thesis is that the skills we associate with writing, are more properly procedural than declarative, tacit than explicit, knowing how than knowing that. We have been seduced by the fact that we use words in writing into believing that writing itself is verbalizable, and can be taught by being talked about.

Let me illustrate by referring again to Douglas Hofsteder, speaking about grammar. Hofsteder suggests we have two grammars: declarative and procedural. The declarative grammar, if we have studied our lessons well and diagrammed our sentences perfectly, allows us to unerringly spot a split infinitive, recognize a noun, or parse a sentence. The grammar we actually use to produce discourse, on the other hand, does not exist as a set of explicitly statable and stored rules at all. Rather, the procedural grammar exists as a set of routines, which, when followed, result in a grammatical utterance. Nor does there seem to be any crossover. We learn a declarative grammar in school, but the overt, learning of that grammar does not seem to transfer to our procedural grammar.

If Hofsteder and others are right, then we have been working under a deep and profound misunderstanding of how not merely grammar and usage are acquired, and used, but all language skills. Such a misunderstanding can lead to a confusion in method. For instance, in the 60's and 70's, the clarity and grace of transformational grammar led many teachers and not a few scholars to believe that there were tiny T-rules and P-rules in our heads which operated on our innermost thoughts, passing an utterance from transformation to transformation until it popped out our mouths or the nibs of our pens as articulate language. If there are T-rules, it was reasoned, and if we can discover them and teach them, then we can facilitate language learning.

Experience proved that transformational grammar worked no better than traditional grammar in helping people learn to write, and traditional grammar had worked not at all.

Of course, there are those who do not agree with me that teaching grammar does no good to help people write. In fact, the subject is a matter of some controversy. The question is the extent to which discussion of linguistic principles helps students learn to produce linguistic structures. There are those who simply say, "It doesn't do any good to talk about writing, because you just don't learn to write that way." When pressed for proof of their contentions, these people have been able only to point to the results of innumerable studies which all say the same thing: there is no connection between a person's knowledge of grammar or usage, and that person's ability to produce a grammatical or socially acceptable utterance. But they've been unable to point to much of a theoretical underpinning for their contentions. And among English teachers, data without a theory isn't worth much.

On the other hand, there are those who contend with much spirit that the discussion of grammar can help writers be more fluent, precise, and grammatical. They have a theory to work with, but they don't have the data. When confronted with the data, they maintain that the scholarship which produced the data was shoddy. It is only logical to assume, they aver, that if we can only discuss a concept, we can learn a concept, and that language skills should be no exception.

Both positions are hard ones to live with, because each is vulnerable to the attacks of the other. However, the scholars I quoted at the beginning of this presentation are at last offering us the possibility of a third choice. It is that choice I should like to discuss.

Let me begin with an initial concept, which springs out of cognitive psychology. The concept is this: humans are hypothesis-making beings. When presented with an array of data of any kind, the human mind immediately begins to order it, to classify it, to arrange it into hierarchies, and to guess about its significance, about its relationship to us and the world. I was going to say that we can no more stop making hypotheses about the world than we can stop breathing, but that analogy is wrong, because this hypothesizing tendency is not only an instinct, like breathing, it is the very basis for thought and consciousness itself. We can stop breathing, hold our breath, but we cannot stop making hypotheses.

I spend time on this concept because our writing classes at the university level, I think, are based, not on these assumptions, but on an older set derived from the stimulus/response theories of behaviorism. This can be made clearer if we make plain a number of underlying postulates we adhere to in the teaching of writing, and which are the basis for the vast majority of textbooks loose in the land. Let me give three:

1. Material to be taught should be presented explicitly.

2. The material will be learned as an act of conscious will.

3. The material thus presented and learned can be verbalized and discussed, or it hasn't been learned.

I'd like to call them "declarative rules of teaching."

Suppose I am teaching an English class, and I want to discuss the principle of the thesis. First, I would give a lecture on the thesis, explaining what it is, what it does, and how to use it. Secondly, following rule two above, I would expect my students to be able to produce, after the discussion, a thesis, or to identify one on a multiple choice quiz, or in an exercise workbook. According to rule three, I would expect my students to be able to say to themselves, "Here I need a thesis. I will construct one according to rules A through D that my teacher , bless him, has given me."

In contrast to the above principles, let me give three which would arise out of the suggestions of Ryle, Polanyi, and Hofsteder,

1. The material to be learned should be presented in the form of examples.

2. The material to be learned should be presented in the form of problems to be solved.

3. The material to be learned should be presented as a means to doing something else.

These are "procedural rules of teaching."

In order to show how these rules differ from the declarative rules that are in use even in those English departments that adhere to a "process, not product" philosophy, let me outline briefly how a program based on the tenets of Polanyi, or Ryle, or Hofsteder might be run. Remember, all this is based on the hypothesis that writing is a skill rather than a body of knowledge, and is difficult to acquire consciously.

The best way to teach language is to make it the way to learn something else, or the only path to a goal the student wants to take. For years, it puzzled psycholinguists how children would undertake the arduous, frustrating, time consuming task of acquiring a language. The answer, some thought, lay in a wired-in brain mechanism which clicked on at a particular time in a child's life, enabling that child to acquire language swiftly and effortlessly. This mechanism, or "language acquisition device," seemed to be the answer to the question, but LAD had much in common with many stages in the perceptual and cognitive development of the child. So much so that some psychologists and linguists simply said that learning a language was very much like learning to distinguish shapes.

Which still left the problem of motive. Finally, the simplest of all surfaced: the desire, no, the determination -- to communicate. Children learn a language because they need one to communicate.

That same drive exists. It can be used to teach writing. But it isn't, at least not very well. We continue to teach classes in which writing is the subject, and though we say, "You can't write well until you have something to say," we don't give them anything to say; we give them techniques, or teach them complex subject gathering strategies called "heuristics," none of which makes the act of writing very important to the student.

If we are to really teach our students how to write, we need to look at written communication as it is used in real life. When you take pains with your writing, it is because what you have to say is important to you. Notice that you don't usually need to know what to say, but how to say it to get a job, or keep a job, or communicate a new discovery, a dandy plan for saving the university money, or a memo outlining a new office procedure. In each case, the fact that you must communicate a particular meaning for a particular purpose guides you through the writing process.

We don't do it that way in writing classes. We teach the personal essay, or the descriptive essay, or the narrative, and the way we teach them, they exist as isolated language samples, cut off from all experience, all purpose. They become, in the jargon of composition, "Engfish," that language written to please the teacher.

Let me return to the point I made some time back. We learn language best as a means to something else. In a university setting, this could probably best be accomplished by disbanding writing classes altogether, and having a writing faculty attached to content classes, trained in both teaching writing and in whichever subject is being taught. Since I am well aware that if such a proposal were ever undertaken, I would be out of a job, and since only a very few organizations and and almost no universities are doing such a thing, let me refer back to two more of the principles I mentioned some time ago.

One of them was that we learn things by example. This theory was neatly explained by Hayes-Roth, who outlined how he believes learning by example works. He suggested a number of important points:

1. All the salient features of the thing to be taught must be present in all examples.

2. No non-salient feature may be present in all examples.

3. An explicit declaration of the thing to be taught is not necessary.

Let us go way back to my example of teaching the thesis. According to Hayes-Roth, it is not necessary to discuss the principle of the thesis at all; it necessarily only to present enough examples of the thesis so that all the necessary ingredients of the thesis are demonstrated time and time again, and no extraneous ingredients are included in every example.

In other words, we learn to write by reading. But, we need to expose our students to the types of writing we are going to require of them. The traditional English class reader gives the students writing that may well contain beautiful language, but often neither strong logic nor exemplary construction.

The second point I made some time back was that we learn by doing. This was illustrated nicely in a study by Anzai and Simon, of a subject working the "Tower of Hanoi" puzzle. This puzzle consists of a board, flat on a table, with three rods sticking vertically out of it, and a series of holed discs of varying sizes. At the beginning, the discs are on one of the rods, arranged so that the largest disc is on the bottom, the discs becoming progressively smaller up through the stack. The object of the puzzle is to move all the discs from one rod to the other, ending up with the discs in the same order. However, in moving the discs, two rules must be observed: one cannot move more than one disc, and no disc may be placed above a smaller disc.

Anzai and Simon report that the subject had trouble her first time through. However, on successive tries, and without any instruction at all, the subject began creating sophisticated routines and subroutines in her mind as she set and reached her goals. The application to writing is obvious.

If we do learn by doing, then we learn to write by writing. Obvious, you may say. Except that we don't do it. Certainly not in the elementary and secondary schools, where students write about twelve minutes a day. Even in the university we don't do much. Consider a typical writing class. One semester will have 18 weeks, with three hours per week instruction, and (supposedly) six hours of study out of class. In a semester, a student will be required to hand in about 6000 words, or about 333 a week. That's not enough to make any change in all.

There are, then, two ways we will make an impact on our writing classes. First, we could involve writing in our other classes at the university. I'm not talking about writing across the curriculum, which doesn't go nearly far enough. I'm suggesting that writing be an integral part of every class, lots of writing; and that this writing be used to communicate to the teacher what the student has learned; and that if the student cannot communicate, the student will not pass. As university personnel, we need to find out what professional writing consultants already know: you can't divorce writing from content, and you can't teach writing without teaching content.

The second option would be to dramatically increase the amount of both reading and writing done in our writing classes, and to dramatically decrease the amount of talking about writing. Students should have to read thousands of words; not just any words, but logically arranged, well structured words. Students should have to also write thousands of words, as much as 1000 a day at a minimum. Nor should there be much talk about a stduent's work from the teacher, no grading or discussion beyond such phrases as "I don't understand this part," or ,"What's your purpose in writing this? I don't get it." Or perhaps, "Why don't you attack this the way you think Issac Asimov would?"

Either option is workable. Both are being used. Neither will become current, though, until we rid ourselves of the notion that we can talk our students into learning to write. We must learn to stand back, to let them work it out. We must learn to let them learn.

SOURCES

Anzai, Y., and Simon, H.A. "The Theory of Learning by Doing." Psychological Review, 1979. 86, 124-140.

Hayes-Roth, F. "Learning by Example." In Lesgold, et al.

Hofsteder, D. Godel, Escher, Bach: An Eternal Golden Braid. New York: Basic Books, 1982.

Lesgold, A. M., et al. Cognitive Psychology and Instruction. New York: Plenum Press, 1978.

Polanyi, M. Personal Knowledge: Toward a Post-Critical Philosophy. New York: Harper Torchbooks, 1964.

Ryle, G. The Concept of Mind.New York: Hutchinson't University Library, 1949.

Smith, F. Writing and the Writer. New York: Holt, Rinehart, and Winston, 1982.

TEACHING AND RESEARCH: THE NECESSARY BALANCE

by

Glenn A. Crosby

Washington State University

BIOGRAPHY - Glenn A. Crosby

Glenn A. Crosby, a professor of chemistry and chemical physics at Washington State University since 1967, has distinguished himself in the field of molecular electronic spectroscopy with particular emphasis on the interaction of light with matter. He received his B.S. degree from Waynesburg College in Pennsylvania and his Ph.D. from the University of Washington. After two years as a postdoctoral fellow at Florida State University, he joined the faculty at the University of New Mexico.

Dr. Crosby has authored over 100 scientific and science-education publications. A recipient of many honors, he was named Professor of the Year at the University of New Mexico (1966-67), received the CMA Catalyst Medal for Excellence in Teaching (1979), and the 1985 American Chemical Society Award in Education. Dr. Crosby has also received the Distinguished Alumnus Award from his alma mater and the President's Award for Excellence in Instruction from Washington State University.

He is a charter member of the Society Committee on Education of the American Chemical Society, chairing its subcommittee on precollege education (1978-83, 1985). He also serves on the Cottrell Advisory Committee of the Research Corporation, the National Advisory Group for Project SERAPHIM, and the Editorial Committee for the NSF/ACS Project on Chemistry for the Community.

TEACHING AND RESEARCH: THE NECESSARY BALANCE

Glenn A. Crosby
Professor of Chemistry and Chemical Physics
Washington State University, Pullman, WA 99164-4630

My topic is the synergism between teaching and research, a subject that preoccupies all of us some of the time, and a few of us most of the time. Currently, it is becoming a much discussed topic. Why are we preoccupied? What causes that vague uneasiness that grips a university scholar or scientist when the issue surfaces? Why does one professor feel obligated to defend teaching and another emotionally disposed to preach, shrilly, the virtues of research? What is the basic subterranean problem that manifests itself in numerous ways: established professors giving up research ostensibly to teach; young scholars feeling oppressed by classroom duties and longing for research appointments or, at least, as little teaching as possible; older mentors failing to inspire the young; others, in their prime, losing interest in intellectual pursuits altogether and disengaging entirely from the academy? I have no satisfactory answer. Nevertheless, the need for balance in the university is self evident. The choice cannot be teaching or research, it must be teaching and research. A healthy institution must continually generate an environment where these cardinal functions are integrated, each reinforcing the other until the whole becomes much, much greater than the sum of its parts.

Balance in an institution is achievable in several ways. One can balance the faculty, individuals primarily engaged in research complemented with those devoted mainly to teaching. With deference and respect for one another and a willingness to admit both the necessity and importance of their respective vocations, they can serve the educational enterprise admirably. Too often, however, friction between teacher and researcher occurs and suspicion and dissension prevail. The researcher, motivated by a reward system that is often external to the university, belittles the committed classroom performer. The teacher, tugged by natural instincts into the classroom and preoccupied with student problems, denigrates the researcher and often questions his motives. Instead of creative tension and dynamic balance, the relationship can degenerate into wild oscillation and institutional debility. How very sad, futile, and totally unnecessary.

The teacher/scholar balance within a single individual is, I believe, more difficult to achieve than institutional equilibrium. The same tensions between the teaching and research functions that are evident in the institution appear as strain and conflict within the individual. One must cope daily with disparate demands. Lectures must be prepared, but a research manuscript should be drafted. A proposal is due, exactly when a major exam is scheduled. A crucial library search is in progress, then office hours interrupt. Quiet is sought for creative thought and contemplation, but a teaching laboratory requires reorganization, demonstrations must be readied, an overwrought student calls and pleads for counsel. The list goes on. Priorities must be set.

What are the priorities? How does one rank the list of demands? If one is not vigilant, 'teaching and research' does become 'teaching or research'. The balance is precarious. Yet, that precious balance is what one must maintain if one is to achieve true fulfillment as a teacher/scholar. It is a matter of steadfast determination. A modicum of intelligence is not the sole prerequisite for success in a university environment. (This is a truism that we should inculcate in the minds of young aspirants.) Determination and physical stamina are often the deciding factors.

I have implicitly assumed in these remarks the usual concept of research: research in a particular field, a scholarly area carved out by an individual, an area in which he feels comfortable, a field that he believes to be important. The quest is discovery, elucidation, and synthesis; the final goal is communication in one form or another. The latter can occur in the classroom, through journals, in seminars, or by talking with students and peers. The choice of subject area is largely independent of the university itself, be it history, mathematics, or chemistry. The creative interaction between teaching and research occurs mainly within the individual psyche. Research methods and attitudes influence teaching. Teaching, that daily brush against young (sometimes obstinate) minds, constantly rekindles enthusiasm and modifies research outlook. This delicate interplay is the essence of a model university environment.

What I have described, however, is the ideal and not the real. For many of us the carryover from the research laboratory to the classroom is minuscule. Somehow we fail to bring to the classroom the excitement and enthusiasm that permeates our research laboratories. Why? Is it because we cannot see a connection between the classroom and the research laboratory? Is there any connection? Or are the methodologies employed in each just too different for us to bridge the gap?

When this subject comes up, many of us hide behind our disciplinary expertise. That is easy to do. We can say, with some justification, that the level of sophistication in a modern laboratory is too high to allow us to bring the material and the methods into the classroom. After all, it took us years to reach the frontiers, and lots of false starts and many cul-de-sacs impeded our journey. One cannot simply distill the essence of what research is all about, prepare a potion of enlightenment, and transform undergraduates. The intellectual gap between extending research frontiers and teaching undergraduates is simply too wide.

To posit a basic incongruity between the research and teaching functions is a position that is easy to defend, as long as one does not question the premises of the argument. What is the central premise? It is, I believe, the notion that the classroom is the place where knowledge is presented, facts are arranged, and the corpus of principles and information that constitutes the discipline is transmitted as effectively as possible. At least that is how many of our courses are taught. Yet, viewed objectively, this concept of the function of the classroom is a barren one. There is no way that the necessary knowledge for mastery of, or even good familiarity with, a discipline can be imparted in the classroom, no matter how efficiently the lecture is conducted, no matter how skillful the teacher. There is just too much to convey. In the light of the current information explosion this statement becomes more of a truism each day.

What, then, is wrong with this implicit view of the classroom and its function? Well, it certainly ignores the central components of great teaching---the ability to inspire and to instill enthusiasm. A great teacher communicates the methodology and modus operandi of a person who is deeply involved in the discipline, comprehends its logical structure, and covets its rewards. Dispensing information efficiently plays a secondary role in the classroom.

There you have it. The reason that research methods, results, attitudes, and enthusiasm fail to permeate the classroom is because many of us have the wrong idea of what the major function of the classroom really is!

To bring the research attitude into the classroom means that we must reorder our priorities. We must begin to focus more on the methodology of the discipline, why it is important, why we labor to comprehend it. Above all, we must inspire the students to learn the field by themselves. The teaching of principles and facts will still be important, but we must focus on communicating those cardinal intellectual and psychological compensations that attracted us to the field. Once this preeminent purpose of the classroom is understood, and it permeates our teaching strategies, then we will be able to instill a genuine research spirit into the classroom.

The research/teaching relationship is, above all, a matter of style. Moreover, except in a few instances, the university contains the laboratory; the university is not the laboratory itself. This observation prompts me to point out a prominent gap in our manifold activities that reflects a fundamental need within universities and, at the same time, presents a magnificent opportunity to integrate the research and teaching functions.

I refer to the basic need of the university to study itself, not as an isolated object of disinterested analysis, but introspectively, with a self-critical albeit constructive eye. Let me illustrate: We are painfully aware that precious little is known about adult learning processes, how college students assimilate information, what determines behavior, what instructional methods really produce lasting impact (not just grades, popularity ratings, and degrees). Yet, I teach, year after year, with only a gut feeling of how to proceed. Forced by the exigencies of budgets or the logistical restraints imposed by large numbers, I constantly modify my methods of teaching, introduce time-saving techniques, and devise new testing schemes. Do these work? Are the students better served? Are there genuine cognitive gains or losses? What about the affective domain? Am I presenting a proper model to the young? Such questions are answerable. They must be, at least partially. And the great laboratory classroom lies before us, fully equipped and literally stuffed with willing subjects.

This brings me to one of the great disappointments of my academic career. In all my years of teaching in universities of considerable size I have never collaborated with members of the education faculty to improve education. No joint projects, no meaningful interaction whatsoever.[*] My experience is not unique. The scientist remains in his laboratory, intent on furthering his research and probing the frontiers of his discipline, while the professor of education secludes himself in his office and designs educational projects. They are both on the same campus, often in nearby buildings. Notwithstanding, they rarely encounter one another socially and never intellectually. While the education professor wrestles over test design, the affective versus the cognitive, or the special problems of the handicapped, across the street the scientist struggles with hundreds of students in one classroom, agonizes over the importance of the laboratories, worries about the validity of test questions, and cannot find the time to read any of the educational literature---at least not enough of it. There he stands, every day, before 300 students who constitute a marvelous laboratory for genuine educational research and nearby are experts to help him use this opportunity meaningfully.

Yet, both the scientist and the professional educator have failed to make use of the university classroom as a laboratory. Why? Partly because we are distracted by temporal concerns, those daily chores that distract us, but that cannot be the sole explanation. Many of us simply do not recognize the great opportunities we have. Our orientation is too fixed and narrow; our purview, limited. We have monumental instructional problems, but we do not even think of calling on our colleagues in the schools of education to help us. Most of us are seemingly unaware that our painfully acquired research skills, methods, and procedures are also appropriate for investigating the teaching and learning processes, too. We are experimental and daring in the research laboratory. Why are we so stuffy and conservative in the classroom? What prevents us from analyzing the very structure of our classroom activities with the same meticulous care that we bestow on lecture outlines or the preparation of manuscripts?

---

[*] For the first time I am involved in a joint project with the School of Education. We are developing a new science sequence designed for elementary education majors to be offered fall 1986.

For the disreputable state of university instruction, the education faculties must shoulder blame also, a lot of it. Paper after paper is published dealing with the problems of education, higher education in particular, but the impact on the current practice in the field is negligible. The attitude of the education specialist seems to be that the instructors in other disciplines have the sole responsibility to sift through the educational literature and find the nuggets of pertinent information. Putting ideas into practice, right in the field where the action is, seems to be beyond the purview of most professors of education. Their perception seems to be that the job is done whenever the article appears in print, irrespective of the relative obscurity of the journal or whether anyone reads the material. In my opinion many of the educational research projects are trivial, well designed perhaps, but not relevant to the great needs of the times. (Every field has its practitioners whose work is never read, but there is always a leadership group, a network of researchers who know what ought to be done and how to go about doing it. In the field of educational research, particularly the area of science education, that group is too small.) From my vantage point they have not been much help at all.

There are revolutions occurring, right now, and the scientists are part of them. Inexorably, computers infiltrate our thinking and, to some extent, the curriculum. We have already assimilated computers in the research laboratories. Our instrumentation is being modified as quickly as possible to interface with them, thereby expanding our research possibilities and aspirations. We clamor for more memory, for more computational power, for more speed. Not to be part of this revolution is tantamount to disengaging oneself from the mainstream of research in a myriad of fields, both theoretical and experimental.

Where are we currently in the educational uses of computers? What do we know about the impact of these machines on the learners, on the way students think? Moreover, how many of us are engaged in the design of definitive experiments to find out whether the uses we do make of computers actually accomplish what we have set out to do? Show me the controlled experiments, the imaginatively designed instruments to test fundamental hypotheses. The laboratory is there. We have hundreds, even thousands, of students marching through our chemistry and physics classes, anxious to try new things and to be part of great experiments. Why are we not in league with our colleagues in the education schools to make use of the magnificent opportunities before us? Where are the leaders?

A second broad area of educational research that merits great attention is that of testing, evaluating the knowledge of students. As the uses of computers, video disks, and technology-oriented teaching increase, the academy needs to evaluate the relevance of the standard methods of testing students. Can we continue to use the same shopworn examination procedures while the revolutions in technology introduce new instructional methods into the classrooms? Are we really examining what we believe to be important? In many cases, I believe we are not, but that itself is an hypothesis to be tested. When are we going to bring the education theorists and the classroom practitioners together to attack the central issues of instruction and evaluation? This integration is the fundamental development on the campus that is sorely needed. Without a working relationship between those who think about education, write about it, and profess knowledge of it and those who labor in the classroom expounding their own disciplines, we will never achieve the kind of far-reaching breakthroughs in educational methods that are so desperately needed.

Some of our best minds should address such questions. A serious career commitment is required, however. Who among us will step from the path and dare to tread on unfamiliar ground? Who will venture to initiate interdisciplinary collaboration? We must carry the experimental attitude, the quest for new knowledge, the spirit of discovery and adventure right into the classroom, into the very process of teaching. When the research spirit has thoroughly permeated the instructional process, faculty renewal will become automatic. The perceived dichotomy of the research and teaching functions will vanish.

During my almost thirty years in academe, years explosive with change, fads have risen and fallen, funding has expanded and shrunk, social upheavals have occurred, entire institutions have come and gone. Although I am rendered nearsighted by being too close to events, one trend is too obvious even for me to overlook. I refer to the inexorable drift toward specialization, by all of us, faculty and students alike. We are part of a chain in which each succeeding link becomes narrower than the last. Since the faculty of tomorrow is a subset of the student population of today, the ever-contracting chain appears to be endless. The prospects for education and for society are depressing. The irony of it all is that this narrowing of outlook is occurring just when the need for a broadly-educated citizenry is exploding.

Nowhere do we see the resultant educational failures more clearly than in our pathetic attempts to patch up the curricula, revise the general education requirements, establish writing clinics, introduce remedial courses, and so on. Noble efforts, indeed, but doomed to be ineffective. (I should know; I am involved in some of them.) We will surely fail to address the real issues in education until significant numbers of both faculty and students discard their respective blinders of specialization and vocationalism and begin to analyze why they are in higher education, what a university should be, what are the truly great educational needs of our times. We must assimilate the research attitude and study ourselves. Only in this way can we possibly break the degenerative chain and free ourselves for intellectual growth.

Can we take off our blinders of specialization and begin to view the university for what it is---a great laboratory for experimentation? Can we extend our horizons to encompass both teaching and research in a meaningful, synergistic way? Do we have the courage to admit individual inadequacies and begin to forge linkages among those with complementary skills so that all can benefit?

Being a teacher/scholar at a university is an exasperating, exhilarating, frustrating, satisfying, great adventure; it is also a humbling experience. So many opportunities abound and so few are seized. So many bright, exciting, enthusiastic students fill the classrooms, but so few are intellectually reached. So many great expectations intoxicate one; so few really new ideas and lasting results appear. So many with the opportunity to lead. So few who accept the challenge. Educators should not, cannot, must not despair, however, for the future depends on us.

THE ELECTORAL COLLEGE IN 1988:
A MODEL FOR NATIONWIDE CAMPUS SIMULATIONS

by

Charles T. Barber

University of Southern Indiana

The Electoral College in the Curriculum

One of the reasons for focus on the Electoral College is its unique character. No other institution of American government weaves federal strands together so effectively. State conventions (Geib, 1985: 159) and political committees, for the most part, select electors, who are certificated by the Governors (Peirce and Longley, 1981:93,102). One of the six certificates signed by electors must be delivered to the judge of the U.S. District Court for that city (Peirce and Longley: 270-271). Then the U.S. Congress counts ballots, which determine who shall serve as President and Vice-President. These features alone, reflecting involvement of state government and all three branches of the national government, guarantee that every student of U.S. politics and U.S. history is expected to know something about the Electoral College.

There are power relationships that enhance human interest in the College. This is evident, e.g., in relation to hairbreadth elections and faithless electors. A hairbreadth election is an election subject to changed outcome with shifts of below one percent of the national vote (Peirce and Longley:259). There have been 22 hairbreadth elections from 1828 to 1984, accounting for 55% of the total. Vote shifts in a few states could have resulted in deadlock or in election of the other candidate.

The faithless elector phenomenon has been less significant, yet reflects the possibility for individualism in the College. In eight elections, individual electors have chosen to select another candidate: twice out of eight elections between 1789 and 1820 and six times out of eight elections between 1948 and 1976 (extrapolated from

Peirce and Longley: 97-98).

Since the College does not provide for equal representation, it has intrigued mathematical and political theorists. Mann and Shapley concluded from a game theoretic exercise (Mann and Shapley, 1964) that there is a pivotal power advantage for the large states. Stephen Brams got more specific, using a weighted 3/2's allocation rule. By cubing electoral representations and dividing each by its square root,[1] Brams was able to identify the nine most populous states as those most powerful in the College (Brams, 1978: 106-107).

Once these built-in biases are recognized, reformers bring forth their plans. An intriguing study of regional biases (Yunker and Longley, 1976) concludes that the East and Far West are most advantaged by the present system. In contrast, the eight Mountain states would benefit from the proportional plan (comparable to proportional representation), the South would gain most from the district plan (declaring a separate winner for each Congressional district), and the Midwest should prefer a direct vote (Yunker and Longley: 41, 44).

The Simulation Model

When I first conducted the Electoral College simulation in 1980,[2] the vote totals were based on the 1970 census. The 1984 simulations reflected changes from the 1980 census: eleven states gained electoral votes and eleven states lost electoral votes. The 1988 simulations will use the same state by state totals, which include seven entities with only three electoral votes.

Our simulation design is purposely easy to use, without a need for computer literacy. At least sixteen students should participate to represent four geographical regions: the Northeast, the South, the

Midwest, and the West. Pieces of paper are placed upside down in a box, with as many pieces as there are students. Each region has an equal number of pieces and one piece of paper has "Vice-President" on it.

Participants draw a piece to find their roles. They then assemble in four corners representing the regional groups. This is the place for flexibility. If a professor wants to deal with the subject quickly, it can be completed within fifty minutes, although feedback discussion would take place at another time. In contrast, if the professor wants more extensive treatment, it can be extended to one week or two weeks. The major opportunity for extension derives from discussion of pertinent issues, including reforms, by each of the regional groups.

Three characteristic elements of a simulation are (1) a structured situation which has been carefully prepared, (2) the game, whether competitive or not, and (3) the critique of the process (see Tansey and Unwin, 1969: 22). Charles Hermann has written about simulations as being amenable to computer analysis. Applying his criteria to this simulation, it might more accurately be called a "simulation game" (Nesbitt, 1971: 11-12).

The Electoral College simulation is most relevant to "American Politics" classes as well as to courses on "the Presidency" and "Elections". Although its applications have been future-oriented, history professors could use it to replicate specific previous national elections. Such exercises could prove of high interest in relation to some of the controversial, hairbreadth years.

There are several ways in which this simulation most clearly employs the teaching/learning approach (Chapman and Cousins, 1974: 65-66).

Role play tends to be open-ended, especially in its longer applications, with no limit within regions on selecting leaders or procedures for casting votes. Decision-making is consequential since the votes cast regionally lead to the candidates' success. Behavior is so free that it is possible to cast votes for non-candidates, as real "faithless electors" have.

Two factors about the Electoral College simulation that have less focus on learning are information needed and payoffs. Each participant receives a one-page Electoral College fact sheet (see Appendix). Those students who want to dig into complexities of the process, however, have many possible sources (see, e.g., Szekely, 1970). On payoffs, the emphasis is on simple quantification: does a candidate receive 270 votes? The open-ended, bargaining possibilities allow, though, for discussion of benefits to be received from choosing one candidate instead of another, as well as using strategy to form a successful coalition.

Findings in 1980 and 1984

The twenty-question debriefing questionnaire gives hints about what occurred in the learning process. It provides indications about facts retained in addition to standard identifiers and attitudinal questions. The results were encouraging in both years.

In 1980, the simulation classes had at least four questions answered correctly by 75 percent or more of their members. In 1984, on four questions, over 90 percent of the students had correct answers.

Even though the actual Electoral College meets in fifty-one different places (the state capitals and Washington, D.C.), the simulation is structured into only four voting places for two purposes:

to have manageable size and to reflect actual regional orientations. Significant change in regional power occurred from 1980 to 1984, with the West and South gaining 17 electoral votes, while the Midwest and Northeast were losing 17 electoral votes. Whereas in 1980, the Midwest and Northeast could have combined for 283 votes and a win, in 1984 they would have fallen short by four votes. In contrast, the West and South could have won by two votes in 1984, whereas they would have lost by fifteen votes in 1980. The South has become a pivotal region, able to manipulate a win by combining with any other region.[3]

The changed status of electoral votes in twenty-two states from 1980 to 1984 did not change the predictive value of the simulations. In both experiments, Ronald Reagan was the clear winner.

This finding was of special interest in October, 1980, when Newsweek and Time were unable to predict the winner. The simulation students projected margins for Reagan over Jimmy Carter of 307 to 228 and 292 to 246, even with a tendency to discount Reagan's 121-17 success in the Northeast. In 1984, Reagan won with 331 and 459 votes in the fall simulations.

Three operational innovations in 1984 were: (1) a bi-state process (using colleges in Indiana and Kentucky), (2) an election cycle process (occurring in April, July, and October), and (3) a ballot process (drawing students from non-political science courses).[4] The election cycle was geared to the primary season (when ballot groups favored Gary Hart for the Democratic Party nomination), the national conventions (when Kentucky students threw the election into the House of Representatives), and the general election campaign.

Projected Methodology for 1988

For simulations in 1988, we would like to select 102 colleges and universities (two for each state and Washington, D.C.) to participate during each of the three election seasons. In order for the nationwide experiment to be successful, we anticipate a trial run during spring, 1987 at twenty colleges and universities (five per region in the West, the Midwest, the South, and the Northeast). Based on our findings from the trial run, we will make modifications so that the 1988 simulations can be as meaningful as possible.

We are giving consideration now to criteria for selection of campuses and courses. On campuses, should we focus on location, including a state capital university for each state, or should we focus on type, such as state plus private or two-year plus four-year? On simulations, should they all be in political science courses, or should they be conducted also in history and sociology courses? On ballots, should there be a mixture of choices or specific ones like psychology and data processing? We would welcome input on these questions.

When conducting simulations during primary and convention seasons, several feasible tickets can be considered. This could necessitate several simulation runs per campus. Efforts for the general election simulations should be coordinated nationwide so that results can be transmitted to the mass media. We will evaluate data using the Statistical Package for the Social Sciences. We will also compare open-ended evaluative responses in an effort to improve our understanding of the relationship between experimentation and education.

NOTES

1 I am grateful to economics instructor George Berger for his explanation of the 3/2 power.

2 The simulation was created and conducted with my wife, Sandra P. Barber.

3 This is a theoretical viewpoint. No region is apt to cast all electoral votes for the same candidate.

4 Sandra P. Barber and Sandra M. Singer coordinated these applications.

REFERENCES

BARBER, CHARLES T., BARBER SANDRA P., & SINGER, SANDRA M. (1985) "College Student Electoral Behavior: An Experimental Simulation." Midwest Political Science Association, Chicago.

BARBER, SANDRA P., & BARBER, CHARLES T. (1984) "College Simulations and Computers: 1984 Electoral Choices." University of Kentucky Community College History and Political Science Conference, Lexington.

BARBER, SANDRA P., BARBER, CHARLES T., & SINGER, SANDRA M. (1984) "Predicting Presidential Elections on College Campuses." Proceedings of the 1984 ISSUE Conference--Chicago, Illinois, 15-18 July 1984, edited by Richard L. Cook: 85-94.

BARBER, SANDRA P., & BARBER, CHARLES T. (1981) "The Electoral College in the '80s: A Role Simulation." Indiana Academy of the Social Sciences Proceedings, 1981. 3rd series, 16: 94-98.

BRAMS, STEVEN J. (1978) The Presidential Election Game. New Haven: Yale University Press.

CHAPMAN, KATHERINE, & CCUSINS, JACK E. (1974) Simulation/Games in Social Studies: A Report. Boulder, CO: Social Science Education Consortium.

GEIB, GEORGE W. (1985) "An Elector's Notebook." Indiana Academy of the Social Sciences Proceedings, 1984. 3rd series, 19: 159-160.

HARDY, RICHARD J., KING, JAMES D., & RIDDLESPERBER, JAMES, Jr. (1982)
"The Presidential Selection Process: Role-Playing in a Large American Government Class." Simulation & Games 13, no.4 (December):451-467.

MANN, I., & SHAPLEY, L.S. (1964)
"The A Priori Voting Strength of the Electoral College," pp.151-164 in Game Theory and Related Approaches to Social Behavior: Selections, ed. Martin Shubik. New York: Wiley.

NESBITT, WILLIAM A. (1971)
Simulation Games for the Social Studies Classroom. New York: Foreign Policy Association.

PEIRCE, NEAL R., & LONGLEY, LAWRENCE D. (1981)
The People's President: The Electoral College in American History and the Direct Vote Alternative. Rev. ed. New Haven: Yale University Press.

SZEKELY, K. S. (1970)
Electoral College: A Selective Annotated Bibliography. Littleton, CO: Libraries Unlimited, Inc.

TANSEY, P. J., & UNWIN, DERICK (1969)
Simulation and gaming in education. London: Methuen Educational Ltd.

YUNKER, JOHN H., & LONGLEY, LAWRENCE D. (1976)
"The Electoral College: Its Biases Newly Measured for the 1960s and 1970s." Sage Professional Papers in American Politics, 3, 04=031. Beverly Hills, and London: Sage Pubns.

APPENDIX

The 1988 Electoral College: A Fact Sheet

What is it? A group of 538 men and women who elect the President and Vice-President of the United States.

Where does it meet? In 51 different cities: the 50 state capitals plus Washington, D.C.

When does it meet? On December 19, 1988 (Monday after the second Wednesday).

How many votes does a state have? Anywhere from three (six states + D.C.) up to 47 (California). Membership is based on Congressional representation, so it changes after every ten-year census.

Who goes to cast votes? Those people representing the party receiving the highest vote total on November 8, 1988 (Tuesday after the first Monday). It is a winner-take-all phenomenon. Two times (1876 with Hayes and 1888 with Harrison) the popular vote winner lost in the Electoral College.

Can an elector go against the pack? Yes. In several years, there have been "faithless electors". In 1976, e.g. Ford elector Mike Padden voted for Reagan.

How many votes are needed to win? 270

What happens if no candidate receives 270 votes? Then the Presidential election goes to the House of Representatives, where each state has one vote. The winner must get at least 26 votes. This has happened two times: 1800 (Jefferson won) and 1824 (J. Q. Adams won, even though Jackson had won a 99 to 84 plurality of the electoral votes). The Vice-President needs 51 Senate votes.

When will the votes be counted? on January 6, 1989, when the Vice-President will announce results to a joint session of Congress.

THE VALUE OF ANALYSIS OF STANDARDIZED PLACEMENT EXAMS: A CASE STUDY OF CELL STRUCTURE

by

Robert V. Blystone

Trinity University

The Value of Analysis of Standardized Placement Exams: a case study of cell structure.

Robert V. Blystone, Ph.D.
Trinity University
San Antonio, Texas

Standardized placement exams serve the obvious role of determining the extent of learning by the students who take these exams. A careful review of these exams can provide extremely important additional data on what, how, and why students learn. The purpose of this paper is to draw attention to the further pedagological use of standardized placement exams.

A nationally drawn group of 20,000 high school students took the Biology Advanced Placement (AP) exam May, 1984. The author served as a reader of the Biology essay section of that Advanced Placement Exam. Of these students, 86% answered the following question:

> Describe the structure of a generalized eukaryotic plant cell. Indicate the ways in which a nonphotosynthetic prokaryotic cell would differ in structure from this generalized eukaryotic plant cell.

During the course of the reading of the essay question above, trends and patterns in the students' responses became apparent. After the June reading, the author requested a random sampling of the exams. College Board/Educational Testing Service made 250 exams available to the author for in-depth analysis. (The students' names and schools remained confidential.) Appreciation is extended to Dr. Harlan Hanson of College Board and Dr. Carl Haag of Educational Testing Service for making possible this analysis. A report of the detailed analysis of the question sample will appear elsewhere.[1]

The College Board is the organization that is responsible for the AP program; the Educational Testing Service provides the operational services. The Advanced Placement program allows high school students the opportunity to earn college credit for course work taken while in high school. The students who take the AP exam usually are enrolled in special high school second-year biology classes taught by superior teachers using college level textbooks. Although the AP exam primarily serves superior secondary school students, the program is, in effect, providing a model for a national curriculum in introductory college biology because students who do well on the standardized exam are granted college credit by numerous colleges and universities around the United States. (See reference 2 for a listing.) The national standardized Advanced Placement Exam in Biology, therefore, can yield a national data base as to the performance of students in introductory college biology.

The direction of the evaluation of the 250 exam set was suggested by the author's initial reading and scoring of nearly 1000 essays during the June 1984 reading. For example, an occasional student would state that the function of the Golgi apparatus was unknown; this was true in 1961, but not in 1984. Some students were relying on definitional phrases that have become trite: "lysosomes as 'suicide bags'." Of the 44% of the students indicating that the nucleus of the cell was limited by a barrier, only 22% indicated that the barrier was a nuclear envelope. Based upon the specific nature of their answers, it was clear that students were learning; however, the content of the responses was not always appropriate.

A sample of 250 exams was chosen to be statistically representative of the more than 17,000 students who answered the cell structure question.[3] The sample was biased so that no trivial responses (no answer at all or blantantly off-beat responses) were included. The scoring procedure was quite different from that used for the June reading. The structures and their frequency of mention by the students have been listed in Table I.

TABLE I

CELL STRUCTURE SURVEY OF THE 1984 AP EXAM IN BIOLOGY

Structure	% listed	Structure	% listed
nucleus	87.2	nuclear envelope	9.6
chloroplast	80.0	chromatin	7.6
cell wall	77.2	flagella or cilia	7.2
mitochondria	63.6	double membrane mitochondrion	7.2
cell membrane	58.8	cell plate	5.2
chloroplast function	57.9	vesicle	3.2
cytoplasm	51.2	microtubule	2.8
rough endoplasmic reticulum	48.8	double membrane choloroplast	2.8
vacuoles	48.4	peroxisome	2.4
difference prokaryote vs eukaryote	46.8	fluid mosaic membrane model	2.4
ribosomes	44.8	microfilament	2.0
membrane bounded nucleus	44.4	spindle	1.6
mitochondria function	36.8	double membrane nucleus	1.6
nuclear membrane	34.8	nuclear pore	1.6
nucleolus	32.4	mesosome	1.6
lysosome	30.8	polysome	<1.0
chromosome	23.6	plasmadesmata	<1.0
prokaryote identification	22.8	desmosomes	<1.0
phospholipid bilayer membrane model	21.6	tonoplast	<1.0
smooth endoplasmic reticulum	16.4	glyoxysome	<1.0
centriole	10.4	cytoskeleton	<1.0

The open-endedness of the essay question was a distinct advantage for this type of survey. Only two directional clues with reference to structure were in the question: 1) photosynthetic - chloroplast and 2) prokaryotic - lack of internal membranes. In any group of exams one can anticipate confusion by a few students, e.g., switching prokaryotes for eukaryotes. Over 15% of the students turned prokaryotes into animal cells. Lysosomes were placed by 31% of the students in plant cells. Ten percent of the students placed centrioles in plant cells with no qualifications. Twenty percent of the exams made no mention of plastids in a structural question that specifically introduces the term photosynthesis. Although they are serious errors, the author has found these errors often on college general biology exams.

The animal cell orientation of a plant cell ultrastructure question was more pronounced than expected. Other aspects of the students' answers were surprising. Below is a listing of cell structural concepts that did not appear with any frequency in the answers.

- virtually no mention of the cytoskeleton or microtubules
- no distinguishing between free and bound polysomes
- virtually no mention of peroxisomes or glyoxysomes
- more than two-fifths of the students did not refer to the plasmalemma

Considerable confusion existed in the students' answers referring to the following structural concepts.

- chromosomes seen in the interphase nucleus
- treatment of the nuclear envelope as a single membrane
- the relationship of the cytoplasmic waterway system and compartmentalization

Many ultrastructural concepts were found to be missing or inaccurately depicted in the exams surveyed.

Reading the exams was, in some ways, like reviewing the historical development of cell ultrastructure. A small percentage of the students accurately represented the cell as it was in the landmark issue of Scientific American, September, 1961.[4] Terms developed in the 1960s such as "powerhouse of the cell", "brain of the cell", and "suicide bag" frequently embellished the structures listed.

In an effort to explain the above results, AP biology instructors, high school science coordinators, readers of the 1985 AP Biology exam, college biology instructors, and professional research cell biologists were interviewed. High school teachers and their science coordinators consistently pointed to three problematic areas in the context of this AP study:

- remaining current in rapidly evolving fields,
- finding lab exercises that would work in their teaching environment and

- obtaining good reliable textbooks.

Several studies have shown that textbooks often represented the curriculum for many science courses.[5] A strong correlation between currentness of the content material and the textbook used was indicated. In states with state-wide textbook adoption policies, the same text edition may be in use for as long as 12 years at a time. Further, a survey of 147 secondary science teachers in the Northside Independent School District of Bexar County, Texas revealed that fewer than 20% of these science teachers were subscribing to a professional journal that would allow them to remain current in science content and pedagogy.

The teachers of Advanced Placement Biology II courses had superior credentials in contrast to the whole population of high school biology teachers. These AP teachers were distinguished by additional hours in science after the baccalaureate, membership in organizations such as the National Science Teachers Association, participation in science education workshops and in some cases serving as biology instructors at community college night schools. They also expressed the same concerns in the three problematic areas mentioned above.

College biology instructors and research cell biologists often had little interaction with high school teachers. College instructors commented that the students they received from high school had differing degrees of science preparedness. Lack of a solid chemistry background was the most problematic issue. Medical school cell biologists were predicatably the most removed from the high school educational system. The professionals at the top of the educational ladder had little idea of how or even that the AP Biology program was providing a *de facto* national curriculum for introductory college biology courses.

The interviews provided no surprising results but they did strongly indicate the direction that should be taken to explain the AP cell structure question results. Textbooks and resource materials should be carefully examined for their impact on potential learning of the students. Guidance on textbook selection and review was provided by the biology textbook issue of Science Books and Films.[6] Reports by Cho et al. and Rosenthal provided methods for correlating learning potential from the texts. [7,8] Ten mainstream biology textbooks, five high school and five college biology texts, were selected for analysis.[9-18] Excerpts of the analysis appears in Table II. A report of the detailed analysis of the cell structure text survey will appear elsewhere.[1]

College texts averaged more than twice as many electron micrographs on their pages than the high school books. Also, the college cell structure micrographs represented were more often the transmission variety than the scanning type. Only one high school text in five used the term "nuclear envelope"; all college texts used the term "nuclear envelope". Only one in five AP responses that listed a nuclear boundary used the term "nuclear envelope". Thirty-one percent of

TABLE II

SURVEY OF SELECTED TEXTBOOKS FOR KEY CELL STRUCTURE INFORMATION

Item	*1	2	3	4	5	6	7	8	9	10
copyright year	80	86	85	83	85	82	83	83	83	85
% ratio cell/book**	4.5	2.3	2.0	2.9	2.1	2.2	2.2	2.6	3.4	2.9
total EM in book	20	57	37	58	41	49	225	119	189	161
EM per 100 pages	2.7	6.5	4.7	7.7	5.0	5.2	19.4	10.1	16.0	13.4
Nuclear membrane	+		+	+	+	+				
Nuclear envelope		~+				+	+	+	+	+
centriole not in plant	X	+	+	+	+	+	+	±	+	+
microtubules	+	+	+	+	+	+	+	+	+	+
ER - Polysome association diagram		X	X	±	±		+	+	+	X
lysosome not in plant	X	•	•	±	+	+	•	+	+	+
peroxisome						+	+		+	+
glyoxysome									+	+
plasmadesmata						+	+	+	+	

*1 = BSCS yellow edition[10]
2 = HBJ BIOLOGY[12]
3 = HEATH BIOLOGY[14]
4 = MERRILL BIOLOGY[15]
5 = OTTO AND TOWLE[16]
6 = ARMS AND CAMP BIOLOGY 2ND EDITION[9]
7 = CURTIS BIOLOGY 4TH EDITION[11]
8 = JOHNSON BIOLOGY[13]
9 = PURVES AND ORIANS LIFE: THE SCIENCE OF BIOLOGY[17]
10 = VILLEE, SOLOMON AND DAVIS BIOLOGY[18]

** cell structure chapter pages divided by the total number of book pages - expressed as a %

+ = correct

TE = teacher's edition

± = vague

X = wrong

~ = correct in places and reverts to nuclear membrane in others

• = discussed, but no distinction where found the student responses placed lysosomes in plant cells, which reflected the more vague handling of lysosomes in high school texts. Peroxisomes, glyoxysomes and plasmadesmata were neither mentioned in the high school texts, nor in the AP exam student responses. The explanation of the lack of student listing of microtubules was difficult. All texts described microtubules, yet only 3% of the students listed microtubules on their AP essays. Animal cell bias in the presentation of microtubular subjects may account for the lack of student listing of microtubules as a plant structural characteristic. In summary, the analysis of the textbooks indicated that the students' knowledge more closely reflected the content of high school texts than it did college texts. One should be mindful that the timed essay question was rather open-ended and that the students' depth of response may have been related to this factor.

The AP biology instructors brought many teaching resources to the attention of the author. The most striking resource was the cell structure transparency set distributed by the American Cancer Society.[19] This widely used teaching set contains the term "nuclear membrane", illustrates chromosomes in an interphase nucleus, and shows no free polysomes or microtubules. The "lollipop" membrane model was used and ribosomes were depicted as randomly distributed on the endoplasmic reticulum surface. Working with the Texas Branch of the ACS, the author is updating the cell structure transparency set for ACS distribution in 1986.

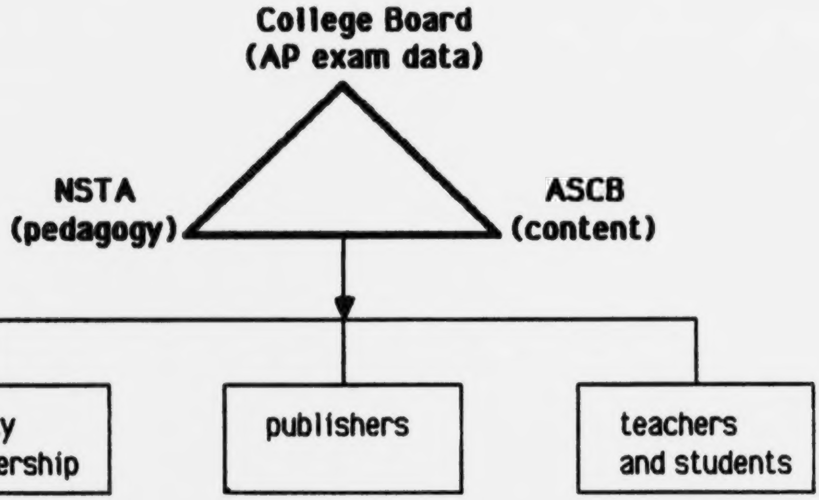
The AP cell structure survey findings have been brought to the attention of the Education Committee of the American Society for Cell Biology (ASCB). The Society has 5700 cell biologists as its members. At the Society's national annual meeting, the Education Committee organized a high school interface. The interface involved the local host committee inviting selected local high school teachers to meet with the local members of the Society and to attend portions of the annual meeting. Local liaisons were established which provided these teachers with future touchstones for cell biology resource information. Selected local high school students were brought to the annual meeting to attend a special scientific program and to visit commercial scientific exhibits. Participants at the meeting became aware of the Society's interest in high school students and teachers. The Society added a contingent of college students from primarily undergraduate schools to the meeting visitation schedule at the 1985 annual meeting. The high school/college interface will be a continuing feature of the annual meeting. Additionally, the Society published a synopsis of the AP cell structure survey in its quarterly newsletter to the membership. Thus, dissemination of the results of this standardized exam can make research cell biologists more aware of how their basic research findings are filtering down to high school and undergraduate college levels.

This report has suggested additional uses of the results of national standardized exams other than the measurement of student achievement. Analysis of the 1984 Advanced Placement Biology essay exam gave considerable insight into the cell structure knowledge of a national sampling of introductory biology college level students. Although these students used college level texts in their AP biology course, much of their terminology reflected "first impression" high school biology text descriptive wording. The study emphasized that extreme care must be expended in developing high school science texts. After reviewing biology textbooks, it was the author's impression that high school and college texts were developed independently of each another. Publishers should consider the development of hierarchically related science textbooks, from high school to college.

Learning resource material often reflected older concepts. The major reason for this was that resource material was revised less frequently than textbooks. Due to its cost-influenced longevity, resource material can be a significant contributor to the continuation of outdated material in a course. Periodic replacement of learning resource materials should accompany the acquisition of text materials.

Professional societies should develop networks with the educational community at all levels. As new directions of thought are developed through basic research, these results must be passed down the educational chain in a timely fashion. Professional societies should consider joint ventures with organizations such as the National Science Teachers Association. Through this type of communication, a science information/education network could be established.

This case study concludes with a proactive model of action.



Bibliography

1 Blystone, Robert V. State of cell ultrastructure knowledge: an analysis of standardized exams and high school and college textbooks. In submission.

2 The College Board. 1984. Advanced Placement Course Description: Biology. Advanced Placement Program, P.O. Box 2899, Princeton, New Jersey 08541. 36 pp.

3 Mosteller, R., S.E. Fienberg and R.E.K. Rourke. 1983. Beginning Statistics with Data Analysis. Addison-Wesley, Reading Mass. 585 pp.

4 Scientific American. 1961. " The Cell Issue." 205(3):1-304. also as The Living Cell: Readings from Scientific American. 1965. Freeman, San Fransico, Calf.

5 Hurd, P.D., R.W. Bybee, J.B. Kahle and R.E. Yager. 1980. Biology education in secondary schools of the United States. Amer. Biol. Teach. 42:388-409.

6 Science Books and Films. 1985. "The biology textbook issue." 20(5): 245-286.

7 Cho, H-H., J.B. Kahle, and F.H. Nordland. 1985. An investigation of high school biology textbooks as sources of misconceptions and difficulties in genetics and some suggestion for teaching genetics. Science Education 69(5): 707-719.

8 Rosenthal, D.B. 1985. Evolution in high school biology textbooks: 1963-1983. Science Education 69(5): 637-648.

9 Arms, K. and P.S. Camp. 1982. Biology, 2nd edition. Saunders-CBS , New York, N. Y. 942 pp.

10 B.S.C.S. Hickman, F.M., supervisor. 1980. Biological Science: an Inquiry into Life, 4th edition. Harcourt Brace Jovanovich, New York, N.Y. 754 pp.

11 Curtis, H. 1983. Biology, 4th edition. Worth, New York, N.Y. 1159 pp.

12 Goodman, H.D., T.C. Emmel, L.E. Graham. F.M. Slowiczek and Y. Shechter. 1986. HBJ Biology. Harcourt Brace Jovanovich, Orlando, Fla. 878 pp.

13 Johnson, L.G. 1983. Biology. W.C.Brown, Dubuque, Iowa. 1177 pp.

14 McLaren, J.E. and L. Rotundo. 1985. Heath Biology. D.C. Heath, Lexington, Mass. 790 pp.

15 Oram, R.F. 1983. Biology: Living Systems. C.E. Merrill, Columbus, Ohio. 758 pp.

16 Otto, J. and A. Towle 1985. Modern Biology. Holt Rinehart Winston, New York, N.Y. 824 pp.

17 Purves, W.K. and G.H. Orians. 1983. Life: the Science of Biology. Sinauer Assoc., Sunderland, Mass. 1182 pp.

18 Villee, C.A., E.P. Solomon and P.W. Davis. 1985. Biology. Saunders-CBS, New York, N.Y. 1206 pp.

19 The American Cancer Society. date unknown. The Cell: Structure & Function. Overhead transparencies for high school biology. American Cancer Society, Texas Division, P.O. Box 9863, Austin, Texas 78766. 15 transparencies (order code 617).

WRITING IN THE DISCIPLINES:
RESEARCH AND IMPLICATIONS

by

Christopher C. Burnham

New Mexico State University

Christopher C. Burnham
Department of English
New Mexico State University
Las Cruces, New Mexico 88003

WRITING IN THE DISCIPLINES: RESEARCH AND IMPLICATIONS

Recent interest in Writing Across the Curriculum (WAC) has motivated researchers to pay close attention to the role writing can play in helping students learn in any discipline. Empirical studies support the assertion that students who write in content courses learn more and better than those who do not. In "Programs for Writing Across the Curriculum: A Report" (College Composition and Communication, 36 [1985]: 398-403), C. W. Griffin illustrates the wide-ranging influence of the movement by collecting and digesting responses from 139 institutions reporting WAC activity. With such an influence, WAC has inspired a whole spectrum of research ranging from considerations of the pedagogical uses of writing to investigations of the kinds and purposes of the writing done in the world of work. Within the context of this research, I have collected samples of the informal writing discipline specialists do in connection with their work in order to determine both the kinds of informal writing done by these specialists and the purpose of that writing. I would like to report this research and discuss its implications for teaching.

Expressive Writing

In The Development of Writing Abilities, 11-18 (London: Macmillan, 1975), James Britton and his colleagues provide the theoretical base for my analysis. They focus on the two primary roles a writer can play when producing language: the participant role in which the writer is using language to get things done, and the spectator role in which the writer is using language to relive the past. As a participant, the writer shapes reality to an end. As spectator, the writer recreates reality (pp. 91-2).

With these roles forming either end of a continuum, Britton derives three categories of writing. In the participant role, writers produce transactional writing, in which language is used to accomplish the business of the world. Transactional writing divides further into informative and conative writing, roughly corresponding to the traditional rhetorical classifications of exposition and persuasion. Informative writing's purpose is to make information available; conative writing's purpose is to influence the writer to action (p. 94). In each instance, transactional writing involves interaction between writer and reader--a transaction. Hence its name.

On the other end of the continuum, writers acting in the spectator role produce poetic writing. Poetic writing is language used as an art medium, as a verbal icon, whose purpose is to be an object that pleases or satisfies the writer. The reader's response is to share that satisfaction. In traditional terms, poetic writing is literary discourse, language which "exists for its own sake and not as a means of achieving something else" (p. 91).

With transactional and poetic writing serving as opposite ends of the continuum described by the participant and spectator roles, Britton establishes a third category, expressive writing, which mediates the two. Expressive writing is more a mode than a form. Examples include "thinking out loud on paper" (p. 89); notes and drafts intended for the writer's own use and for use by collaborators; journal writing, whose function is to document or explore the writer's immediate thoughts, feelings, and moods; and personal letters written to friends and relatives to maintain close personal contact with them. Expressive writing finds the writer shuttling back and forth between participant and spectator roles, generating and discovering ideas, and then shaping them into language that can stand on its own. With its discovery function, expressive writing plays a crucial role in learning to write: "it is a kind of matrix from which differentiated forms of mature writing are developed" (p. 83). In short, expressive writing in its various forms maps the process through which formal discourse evolves. Expressive writing is the basis for a developmental model of writing which can inform both the teaching of writing and, because it plays an instrumental role in the learning process, the teaching of all disciplines.

For language teachers, expressive writing provides a theoretical framework in which to view journal keeping, freewriting, brainstorming and other informal writing within a unified view of the composing process. What must be demonstrated, however, is that expressive writing plays an important role in the work of discipline specialists.

Faculty Attitudes

In the last four years, approximately 100 New Mexico State University faculty have participated in week-long WAC seminars sponsored by the University and the NEH. These seminars are designed to raise faculty awareness of the relations between writing and learning, demonstrate specific techniques faculty can use to improve teaching through the use of writing, and increase the quantity and quality of student writing. Based on interviews, surveys, and analysis of writing samples collected from faculty participating in these seminars, I offer the following regarding faculty attitudes towards and use of expressive writing.

Faculty attitudes toward expressive writing describe a wide range. Some are extremely positive; others quite negative or business-like. Those whose responses are most positive seem to have integrated writing completely in their professional lives. Interestingly enough, the most positive responses come from scientists and engineers. They keep extensive field notebooks which include frequent asides, insights, notes not on task, and ideas they must put aside to investigate later. These notebooks include several "languages." In addition to mathematical equations and sketches and diagrams, words appear which are used either expressively, such as "Oh, no's" appearing in the middle of equations going wrong, or transactionally, to record some detail. These specialists insist their expressive language is a combination of words, equations, and sketches since they think in each of these modes. These same specialists report frequent use of expressive language in correspondence with colleagues, generally collaborators. Their correspondence must establish a personal as well as a professional presence. Including expressive elements in their correspondence permits some very close and critical commentary about methods and results while preserving the trusting and cooperative spirit required of a collaborative project. The participants who responded favorably reported very frequent, self-sponsored episodes of expressive writing.

The most negative responses indicate an almost undergraduate attitude toward writing in general. Writing is not an integral part of daily work activities; it serves only to document activities. Writing is rarely self-sponsored. Any expressive writing beyond record keeping occurs only when the respondent is working on a specific and imposed transactional task. These writers draft economically, to get the job--the speech, lecture, or article--done. They communicate specific, already known information in their writing. Their concerns are organization and correct style. Their attitude is that writing is work and important only in that context.

Four Case Studies

Despite the wide range of attitudes faculty exhibit, there are some types of expressive writing that seem to be used in common. These include lecture and reading notes, marginal commentary on student writing, and other writing done for teaching and university-related activities. Close analysis of journals and correspondence, however, suggests that there is a considerable amount of expressive writing used in completing the work of the disciplines and that the forms and purposes of this writing closely reflect the dominant concerns and values of the specific discipline. Such an assertion is based on specific case studies. I will discuss four.

The first case, a chemical engineer, reports using expressive writing as a specific, task-related, problem-solving activity. He initiates expressive writing only in service to a particular task. The form of his expressive writing is highly field specific. In addition to a file of research notes, he keeps a lab notebook containing quotes and summaries, complex mathematical equations, and diagrams and sketches. The occasion is a particular design problem which he has been assigned. The purpose is to generate, evaluate, and adapt ideas. He must discover what engineering principles will be at work in a system, decide the nature of their interactions, and develop an application. He struggles to measure principles against applications. His lab notebooks reveal the specialized thinking dynamic of his discipline.

The next case, a psychiatric nurse supervisor, uses expressive writing extensively; writing is an integral part of her work in the hospital. She keeps three separate journals. The first contains anecdotal reports, truncated narratives, of her supervisory activities, which are subsequently formalized as official evaluations. This field-specific journal reflects her responsibilities as a manager and supervisor.

Her second journal, a "pocket planner," contains specially designed forms employing shorthand notations to describe patient behavior, evaluate drug therapy, and note other vital information. Though considered "expressive," the pocket planner contains information which must be understandable to other health practitioners. In addition, it serves a legal function. The pocket planner, like rounds records in general, can be subpoenaed and used as evidence in court. It is clearly a field-specific form of expressive writing.

Perhaps as a result of the quasi-public status of the pocket planner, she keeps another personal and private "impressions notebook." Almost always at her fingertips, she uses it to record subjective reactions to work situations, insights about health care management and related professional topics, and images and metaphors that come to her during the day which describe her emotional state of mind. In this way she monitors her own "health care." She reports developing some of the material in her impressions notebook into transactional pieces for professional publication and sometimes into poems. While the primary purpose of most of her expressive writing is record keeping and documentation, it is also integral to the training she offers her staff and students, the therapy she provides her patients, and the therapy she reserves for herself.

The third case, a microbiologist, illustrates that expressive writing is also central to the activity of scientists. He keeps an expansive lab notebook. In this lab notebook he records data from experiments in progress as well as what he calls "musings," his preliminary attempts at understanding the data. The data can take many forms--tables, diagrams, sketches, and related commentary. In addition, he includes summaries and evaluations of other relevant data. In sum, the lab notebook provides a complete record of his professional life.

Other forms of expressive writing reported by the microbiologist include what he insists is a special genre--instructions for technicians. These instructions are crucial to the success of his experiments, and they are, therefore, the object of considerable energy. These instructions are expressive, he claims, because they consist of highly specialized language tied to the context of the particular experiment. The audience is exclusively the lab technician working with him on the experiment. He also reports that much of his professional correspondence is expressive. Generally written to collaborators, it contains both professional and personal content. The writing is multi-layered, addressing specific aspects of experiments and the implications of findings as well as the general progress of work, career, and family. Including both transactional and expressive elements helps maintain the cooperative spirit needed for fruitful collaboration.

All the instances of expressive writing mentioned here seem quite field specific. The primary purpose seems to be recording data accurately and providing room and the opportunity for "musing" to begin discovering what the data mean. The extensive expressive writing done by this scientist illustrates how objective observations rest on an intuitive foundation. This phenomenon suggests that the lab notebook may be the truest map of the scientific method.

The final case, that of an educator, uses the least field-specific forms of expressive writing, but she is the most prolific expressive writer. She writes to integrate her personal and professional lives. She reports keeping several informal "yellow pad" notebooks, two more or less systematic journals, and an elaborate index-card file. Her yellow pads include one at her bedside for recording dreams and other fleeting insights. She remarks that many of her dreams are work related and contain solutions to real problems. She will literally sleep on a problem and discover the solution. She keeps another yellow pad on her desk for recording insights and ideas about various topics while working in completely unrelated areas. Another yellow pad includes sets of collaborative brainstorms, a technique she uses frequently and with success.

In addition to her frequent yellow-pad writing, she writes systematically in two journals. She writes each night in a personal journal though she reports most of the writing relates to projects and occurrences of the day. She also keeps a work journal to document her daily activities. Most often the work journal deals with particular problems--sessions to counsel faculty she supervises, reports of student complaints, budget expenditures, and the like. It functions something like the psychiatric nurse's pocket planner.

Her index-card file includes reading notes, summaries of articles including her personal reactions, evaluations, and potential applications. She insists that she has not mastered material until she has put it into perspective by writing about it. The various purposes of this educator's expressive writing include problem solving, record keeping, learning, and therapy. She is an apt case to conclude an examination of expressive writing by specialists. As an educator she has discovered the vital role expressive writing can play in a life devoted to learning and the communication of learning.

Implications

The size of my sample prevents me from making any great claims or generalizations. It does, however, establish some facts about expressive writing. First, while demonstrating attitudes ranging from enthusiasm to abhorrence, specialists recognize that much of the writing they do in their work is, by Britton's definition, expressive writing. Second, they report a wide range of forms and occasions for expressive writing. Many of the forms and occasions are field specific. The purposes range from simple record keeping through specific problem-solving techniques and general learning strategies to personal therapy.

I see several implications in this research. The first has to do with the scope and purpose of a freshman writing sequence. A university's basic writing requirements must meet the present and eventual writing needs of its students. Thus, these courses must teach considerably more than simple rhetorical forms and grammatical correctness. These may be starting points, but students must also learn generalizable writing skills which will serve them in their subsequent studies. Students must learn and receive practice in observing and recording, describing objectively, summarizing, paraphrasing, and writing precis and syntheses. These are the specific writing skills that inform the hybrid writing forms developed to report research in the disciplines. These are the thinking and writing skills a student will need to complete a science lab report, a technical report in crop sciences, a humanities research paper, or a social science case study.

At the same time, the freshman writing sequence must introduce students to the expressive writing that serves as the foundation for formal writing. Students must be exposed to both personal journals and formal work journals. The larger implication is that freshman writing courses must spend more time informing students about the kind of writing they will be doing in school and at work. In order to do this, writing teachers themselves must study the way various disciplines use all kinds of writing. And writing programs must be given more time to complete their task; more and various kinds of writing course must be developed and required.

A second implication involves the nature of teaching within the disciplines. Professionals and teachers alike must become more aware of the various types and purposes of the writing they do in their work. They must pay special attention to the expressive writing they use while discovering, recording, and synthesizing what they will ultimately report to others. Moreover, discipline teachers must be prepared to demonstrate how students can use expressive writing to learn a discipline. Students should be exposed to this writing in methodology courses developed to introduce students to the procedures and values of the discipline. Such a course could be the first specialized lab course in an engineering or science major, an analysis course in history, or the fieldwork practicum in social work.

An Exercise

In order to begin to raise awareness of the types of writing done within a discipline, faculty could complete the following exercise. Especially helpful would be having several colleagues from the same discipline collaborate and share results. In addition, a consultation with a writing specialist who can help discipline specialists integrate the various forms of writing discovered in the exercise into formal discpline writing assignments would be helpful. This exercise is an adaptation of the one I have used in the New Mexico State University WAC faculty seminars. It is also the basis for the information reported in this paper. It is the kind of exercise which when completed by an entire departmental faculty could be the first step in designing the introductory course in discipline procedures and values called for above.

First, keep a log of all the work-related writing done within a five-day period. Save all documents including notes and jottings, data sheets, drafts, field and lab notebooks, informal memos, and other kinds of expressive writing, as well as any final written products produced during the period.

Next, having collected all these documents, sort them into categories to determine major purposes and forms. Pay special attention to the expressive writing done to support the formal writing. List the groups and the purposes and prepare to share them with students. Be prepared to demonstrate how the various kinds of writing reflect the nature and values of the discipline and contribute significantly to its work.

Conclusion

Understanding the relation between writing and learning and how this relationship is embodied in the expressive writing done by specialists in their work creates an imperative for educators. We must expose our students to a wide range of writing tasks and purposes. We must integrate writing into the training of our students. If we do not, then we are neither adequately training our apprentices, nor responding to their needs.

TEST ANXIETY AND ACADEMIC ACHIEVEMENT

by

Moon K. Chang

Peru State College

Undoubtedly test anxiety is a troublesome condition found to be prevalent today among college students. Over the years various attempts have been made to explore the role of test anxiety in the academic achievement process. To what extent test anxiety affects academic achievement of college students? What are the techniques found to be effective in reducing test anxiety and in increasing academic performance in the test situation? This paper addresses these questions.

Test Anxiety and Performance

Most researchers indicate that test anxiety consists of two major factors: worry (cognitive manifestations of anxiety) and emotionality (Liebert & Morris, 1967). Worry refers to cognitive concerns about the consequences of failure, doubts about one's own competence and negative self-evaluation; and emotionality refers to subjective perceptions of physiological arousal and unpleasant feeling states like tension and nervousness (Jersusalem, 1985). Emotionality is largely unrelated to academic performance itself (Phillips, 1985; Tyron, 1980), but worry is most consistently and inversely related to academic performance, whether it be test scores or course grades (Deffenbacher, 1977). It is worry that is the predominant source of test-taking interference (Morris, Finkelstein, & Fisher, 1976). Therefore, the logical conclusion appears that treating worry aspect of test anxiety might reduce test anxiety and increase the test performance. However, this is not the case. The worry and emotionality components of test anxiety are theorized to be conceptually independent; however, the two components are expected to co-vary in stress situations because the situations contain elements related to the arousal of each (Morris, Davis, & Hutchings, 1981). Finger and Galassi (1977) has demonstrated the interrelatedness of the two components of test anxiety. Their research failed to support the specific predictions that emotionality-focused treatments would reduce scores on measures of debilitating anxiety and emotionality without affecting scores on worry and that worry-focused treatments would reduce scores on measures of debilitating anxiety and worry without affecting scores on emotionality. Consequently, it appears that to design test anxiety treatments that simultaneously reduce both the discomfort of emotionality and the cognitive interference of worry is desirable (Morris, Davis, & Hutchings, 1981). In fact, a review study by Di Tomasso (1980/1981) concluded that combined treatment formats targeting both worry and emotionality aspects of test anxiety were the most successful.

Sources of Anxiety and Anxious Students

At least four interpretations of achievement anxiety can be discerned from the literature: anxiety as failure-of-self, anxiety as cognitive worry, anxiety as arousal, and anxiety as skill deficiency. The view of test anxiety as skill deficiency stands in considerable contrast to the first three views. In its more general form, this view can be interpreted as emphasizing an indirect causal linkage between anxiety and performance via impaired study skills :ineffective study -- poor performance; and anxiety -- ineffective study -- poor performance (Covington, 1985). A negative relation between study habits, anxiety and test performance (Lin & McKeachie, 1970) and the centrality of good study habits to achievement are supported by research studies (McCordick, Kaplan, Finn, & Smith, 1979). Benjamin, McKeachie, Lin, and Holinger (1981) suggest an information processing model to provide useful concepts for the analysis of test anxiety. This model explains the performance deficit of high test anxious students in terms of problems in encoding and organizing information and in retrieval of this information in a test situation. These researchers indicate that the problems of high anxious students lie all along the continuum from poor study habits, which lead to deficiency in learning the material and organizing it, to worry in the test situation that diverts their attention in such a way that they are unable to retrieve the required information. However, Paulman and Kennelly (1984) reported that test anxiety and test-taking ability independently influence cognitive problem solving in evaluative setting.

Test Anxiety, Achievement, and Treatments

The two-components of test anxiety are useful conceptualization. Test anxiety appears to be a multidimensional problem which requires a treatment program that includes techniques designed to address a number of factors that produce test anxious behaviors and a process of teaching the proper skills to remediate the deficiencies. Students react with various emotions related to either success or to failure as they go through the temporally-ordered achievement stages, namely, test-anticipation stage, test-preparation stage, test-taking stage, and test-reaction stage (Covington, 1985). In order to succeed in optimizing performance among test anxious students the most effective strategies likely involve direct instruction in productive thinking skills and improved study skills as well as methods to neutralize the disruptive effects (emotionality component) of test anxiety (Covington, 1984).

A review study by Tyron (1980) indicates that almost any types of treatments seem to reduce self-reported test anxiety (emotionality aspect of test anxiety). These techniques include attentional treatment, covert reinforcement, cognitive therapy, modeling, inoculation, systematic rational restructuring, desensitization, implosion, relaxation, cognitive modification, study skills, pseudotherapy, group mediation, and even credible placebo procedures. Other useful techniques include meditation (Kirkland & Hollandsworth, 1980) and hypnosis (Johnson & Johnson, 1984).

The theory that all test anxious students perform poorly (Kiesler, 1966) is a myth. Test anxiety is but one factor affecting test grades. Some students who are anxious about tests nevertheless perform well on these tests (Galassi, Frierson, & Sharer, 1981). However, research shows that study habits and test-taking skills of high anxious students are generally poor (Culler & Holahan, 1980; Kirland & Hollandsworth, 1980). Specificially, high test anxious students do poorly on essay questions and on a take-home test that does not emphasize retrieval, report problems in learning materials throughout the course, have problems in picking the important points in the reading assignments, and encode the information at a more superficial level, but do well on multiple choice questions that involve less active retrieval (Benjamin, McKeachie, Lin, & Holinger, 1981). Furthermore, high test anxious students do poorly on multiple choice verbal aptitude items (Rocklin & Thompson, 1985).

Cognitive treatments (worry aspect of test anxiety) which result in significant reductions in self-reported test anxiety and increase in achievement include cognitive counseling (Holroyd, 1976), which aims directly at replacing negative self-reference thoughts with statements that facilitate attention to task, study skills (Annis, 1984; Everson, 1985) or a combination of study skills and other treatments (Blackmore, 1983; Mitchell, Hall, & Piatkowaska, 1975).

Studies of test as teaching aids have focused mostly on test performance under anxious conditions. Under anxious conditions students are working for the grades. Generally, tests used as study aids prior to learning of study units facilitated achievement as measured by examinations administered to the students upon the completion of the study units (Fitch, Drucker, & Norton, 1951). However, tests as study aids under non-anxious conditions did not facilitate test performance of both high and low test anxious college students (Chang, 1985). Under non-anxious conditions students do not work for grades; they are internally motivated to obtain knowledge.

In summary, test anxiety can be viewed conceptually as two separate but covaried components of worry and emotionality. Consequently, treatments have been designed so as to reduce both discomfort of emotionality and the cognitive interference of worry simultaneously. Almost any types of treatments seem to reduce self-reported emotional aspect of test anxiety; however, changing student's academic performance is another matter. Supplying the anxious students with improved study techniques and with effective problem solving heuristics to replace unproductive worry seem to work best. Although research results are not conclusive, it appears that multimodal approaches are the most desirable to reduce test anxiety and increase academic achievement of college students.

References

Annis, L.F. (1984, September). *Improving college study skills and reducing anxiety: The effects of a model course*. Paper presented at the annual meeting of the Mid-Western Educational Research Association, Chicago.

Benjamin, M., McKeachie, W.J., Lin, Y., & Holinger, D.P. (1981). Test anxiety: Deficits in information processing, *Journal of Educational Psychology*, *73*, 816-824.

Blackmore, S.H. (1984). A comparison of training in stress inoculation, effective test taking techniques and study skills as treatments for test anxiety (Doctoral dissertation, Texas A&M University, 1983). *Dissertation Abstracts International*, *44*, 2723A.

Chang, M.K. (1985, June). *Study-aid test and level of anxiety*. Paper presented at the sixth international conference of the Society for Test Anxiety Research, Dusseldorf, West Germany.

Covington, M.V. (1984). Anxiety management via problem-solving instruction. In H.M. van der Ploeg, R. Schwarzer, & C.D. Spielberger (Eds.), *Advances in test anxiety research: Vol. 3* (pp. 39-52). Lisse: Swets & Zeitlinger.

Covington, M.V. (1985). Test anxiety: Causes and effects over time. In H.M. van der Ploeg, R. Schwarzer, & C.D. Spielberger (Eds.), *Advances in test anxiety research: Vol. 4* (pp. 55-68). Lisse: Swets & Zeitlinger.

Culler, R.E., & Holahan, C.J. (1980). Test anxiety and academic performance: The effects of study-related behavior, *Journal of Educational Psychology*, *72*, 16-20.

Deffenbacher, J.L. (1977). Relationship of worry and emotionality to performance on the Miller Analogies Test, *Journal of Educational Psychology*, *69*, 191-195.

Di Tomasso, R.A. (1981). A meta-analysis of therapy outcome research with test-anxious college students (Doctoral dissertation, University of Pennsylvania, 1980). Dissertation Abstracts International, 41, 3884A.

Everson, H.T. (1985). The effects of test anxiety and instructional treatment on the cognitive processing of instruction (Doctoral dissertation, City University of New York, 1985). Dissertation Abstracts International, 46, 1257A.

Finger, R., & Galassi, J.P. (1977). Effects of modifying cognitive versus emotionality responses in the treatment of test anxiety, Journal of Consulting and Clinical Psychology, 45, 280-287.

Fitch, M., Drucker, A., & Norton, J. (1951). Frequent testing as a motivating factor in large lecture classes, Journal of Educational Psychology, 42, 1-20.

Galassi, J.P., Frierson, H.T., & Sharer, R. (1981). Concurrent versus retrospective assessment in test anxiety research, Journal of Consulting and Clinical Psychology, 49, 614-615.

Holroyd, K.A. (1976). Cognition and desensitization in the group treatment of test anxiety, Journal of Consulting and Clinical Psychology, 44, 991-1001.

Jerusalem, M. (1985). A longitudinal field study with trait worry and trait emotionality: Methodological problems. In H.M. van der Ploeg, R. Schwarzer, & C.D. Spielberger (Eds.), Advances in test anxiety research: Vol. 4 (pp. 23-34). Lisse: Swets & Zeitlinger.

Johnson, R.L., & Johnson, H.C. (1984). Effects of anxiety-reducing hypnotic training on learning and reading-comprehension tasks, Journal of the National Medical Association, 76, 233-235.

Kiesler, D.J. (1966). Some myths of psychotherapy research and the search for a paradigm, Psychological Bulletin, 65, 110-136.

Kirkland, K., & Hollandsworth, J.G. (1980). Effective test taking: Skills-acquisition versus anxiety-reduction techniques, Journal of Consulting and Clinical Psychology, 48, 431-439.

Liebert, R.M., & Morris, L.W. (1967). Cognitive and emotional components of test anxiety: A distinction and some initial data, Psychological Reports, 20, 975-978.

Lin, Y.G., & McKeachie, W.J. (1970). Aptitude, anxiety, study habits, and academic achievement, Journal of Counseling Psychology, 17, 306-309.

McCordick, S.M., Kaplan, R.M., Finn, M.E., _ Smith, S.H. (1979). Cognitive behavior modification and modeling for test anxiety, Journal of Consulting and Clinical Psychology, 47, 419-420.

Mitchell, K.R., Hall, R.F., & Piatkowska, O.E. (1975). A program for the treatment of failing college students, Behavior Therapy, 6, 324-336.

Morris, L.W., Davis, M.A., & Hutchings, C.H. (1981). Cognitive and emotional components of anxiety: Literature review and a revised worry-emotionality scale, Journal of Educational Psychology, 73, 541-555.

Morris, L.W., Finkelstein, C.S., & Fisher, W.R. (1976). Components of school anxiety: Developmental trends and sex differences, Journal of Genetic Psychology, 128, 49-57.

Paulman, R.G., & Kennelly, K.J. (1984). Test anxiety and ineffective test taking: Different names, same construct? Journal of Educational Psychology, 76, 279-288.

Phillips, B.N. (1985). Test anxiety in school settings: Application of the aptitude-treatment interaction concept in research on test anxiety, instruction, and minimum competency testing. In H.M. van der Ploeg, R. Schwarzer, & C.D. Spielberger (Eds.), Advances in test anxiety research: Vol. 4 (pp. 69-78). Lisse: Swets & Zeitlinger.

Rocklin, T., & Thompson, J.M. (1985). Interactive effects of test anxiety, test difficulty, and feedback, Journal of Educational Psychology, 77, 368-372.

Tryon, G.S. (1980). The measurement and treatment of test anxiety, Review of Educational Research, 50, 343-372.

A MODEL FOR BRIDGING THEORIES AND APPLICATIONS: TEACHING CLASSROOM DISCIPLINE

by

Lily Chu

New Mexico State University

Model for Bridging Theories and Applications:
Teaching Classroom Discipline

Lily Chu

Year after year, national polls and surveys report that parents and teachers in this country consider discipline a major problem in our public school systems. For example, between 1963 and 1983, 14 out of 15 Gallup Polls found that the American public viewed discipline as the most important problem in public schools (Elam, 1978). The National Teachers Opinion Poll of 1979 (NEA, 1979) found that teachers ranked discipline as their major concern and their major cause of job related stress. These tend to suggest that teachers felt underprepared in dealing with the discipline problems which obviously exist in our public schools.

This is not to say that we do not have a body of knowledge of how behaviors are formed, shaped, and changed. In fact, if one examines the current literature in this area, one is overwhelmed by the research on motivation and behavior which can be applied to classroom discipline. There are also several major and well-established models of discipline building; these range from Skinnerian or Neo-Skinnerian model of behavior modification (Axelrod, 1977), Glasser's model (1965) of logical consequences, Dreikurs' model (1968) of confronting mistaken goals, Ginott's model (1971) of using sane messages, Gordon's model (1974) of teacher effectiveness training, Kounin's model (1977) of group management, Jones' model (1979) of incentive systems, to Canter and Canter's model (1976) of assertive discipline. Futhermore, there have been systematic studies to develop district-wide discipline; to examine the use of punishment, suspension, and expulsion; to identify skills in classroom management and preventive discipline; and to deal with unique populations and serious violence, crime, and vandalism in schools (Phi Delta Kappa, 1985). It does not appear that we are short of tools and theories in dealing with discipline. Rather, it appears that there is a gap between theories and applications, and that we need to bridge the gap at the university level so that teachers and prospective teachers will have a sound theoretical base from which to make applications.

Transfer of knowledge from one learning setting to the other has been studied by cognitive psychologists. Generally speaking, the research in this area indicate that positive transfer of learning can be facilitated by increasing the similarity between original and new settings, by stressing the common principles and relationships between them, by making learning meaningful and relevant, and by providing opportunities to learners to practice transfer skills (Royer & Perkins, 1977). The present study intended to utilize these principles to bridge theories and applications in teaching C EP 507 Classroom Discipline to teachers and prospective teachers.

Discipline has different connotations to different people. Unfortunately, the vast majority of these connotations tend to be negative ones such as punishment, detention, spanking, badness, pain, retribution, etc. In the present model, however, the positive aspect of discipline was stressed. As the Latin root of discipline implied teaching and learning, we defined discipline as self control, an internally imposed force to guide one's behavior in learning. Because of this emphasis on self responsibility, the understanding of the reasons for discipline and long term consequences of one's behavior was stressed. Just as the proverb suggests that an ounce of prevention is worth a pound of cure, we stressed the importance of preventive discipline and that interesting and motivating classes would have fewer discipline problems. Finally, we made the assumption that teachers needed to improve their self control before they would be able to employ consistent and effective means in their daily interactions with their students to enhance students' self control. Teachers had to accquire ways and skills to observe and change their own behaviors before they could be effective changing agents in the classroom structure. The interaction between teachers and students was the focus of this model of discipline, rather than treating students as being shaped passively by the controlling teachers, equipped with behavioral techniques. Thus, this model employed a cognitive behavioral orientation of behavioral change (Bandura, 1977).

Method

Counseling & Educational Psychology (C EP) 507, Classroom Discipline, was a graduate class recently implemented at New Mexico State University. It was offered to the current teachers who sought continuing teaching certificates, and other graduate students working toward teaching certificates. In the Fall of 1985, 33 students enrolled in the class, of which 28 were females and 5 were males; 18 were currently teaching in the public schools and 15 were prospective teachers; 3 eventually dropped, 1 received an incomplete grade and 29 completed this course.

The first 11 class sessions were devoted to theories and principles of discipline. Two textbooks were used. Building Classroom Discipline (Charles, 1985) provided an overall view and a broad coverage of all eight major models. During the 7th week, Behavior Management (Walker & Shea, 1984) was introduced to provide an in-depth guide to behavioral techniques and data management. Outside research studies, audio-visual materials, lectures, discussions, and occasional role playing were employed to make the lectures relevant and meaningful. The students were quizzed over the material covered by each textbook.

Each student was required to conduct two projects: one on self-improvement and the other on a behavioral change in a selected classroom setting. Individual consultations on a weekly basis were provided for students in order to assist them to design and implement their projects. The Self-Improvement Project, started on the 2nd week, was to change a behavior which the student desired to alter. Many students utilized biofeedback equipment and self-development cassette tapes available through the Counseling Center at New Mexico State University, whereas some others tailored their own behavior modification projects with the assistance of the instructor (Watson & Tharp, 1985). Starting with the 8th week, the Classroom Project lasted until the end of the semester. The targets for Self-Improvement ranged from weight reduction, anxiety reduction, relaxation training, to the development of interpersonal skills. For the Classroom Projects, some students worked with a single child, whereas others worked with a whole class in the public schools. Samples of the Classroom Projects included reducing temper tantrums of an autistic child, token economy in a classroom, increasing the completed assignments by a child, contingency contracting to increase attendance of five selected students, contingency management of on-task behavior, among others.

Result

The effectiveness of this model was difficult to evaluate, as it lacked an external evaluation, and lacked the long-term results of how these students would continue to implement the skills they learned in this class within their own classrooms. It is intended that when this teaching model is utilized again a better evaluation plan will be made.

However, the grades of the students based on the two quizzes and the projects, the success of the students' projects, and the students' formal classroom evaluation, as well as their informal classroom comments and feedback might be able to provide some information on the efficacy of this model.

Grades:

Of the 29 students who completed the class, 13 received A's, 14 received B's, and 2 received C's. The 2 students who received C's (a failing grade for graduate students), failed the theoretical part of the class and did a somewhat passable job on the projects. Considering the 90% standard for an A, 80% standard for B, and less than 80% standard for a C in this class, most of the students did quite well. Although students' grades from the theoretical part and the projects tended to be related, most students received higher grades from the projects than from the theories. The average G.P.A. for 14 current teachers was 3.35, and for 15 prospective teachers was 3.38, a difference that was not significant.

Self-Improvement Project:

Twenty points were given to this part of the class, and most students (*N*=23, 79%) received full marks. Most students did very well on this task, enjoyed the project, and thought that it was beneficial to their personal growth. There was no difference in the points received by current teachers and prospective teachers.

Classroom Project:

One hundred points were given for the paper and presentation on the Classroom Project, based on the design of the project, the appropriateness of the techniques used, and the effective application of the theories.

Current teachers received higher points ($\underline{X}$=95.93) than prospective teachers ($\underline{X}$=91.20); the difference was significant ($\underline{t}$=2.67, $\underline{df}$=27, $\underline{p}$<0.05). Current teachers in general carried their projects longer, used more effective techniques, and created more positive changes in their classrooms. They also verbally expressed more enthusiasm toward this part of the class assignment, saying that it was relevant and practical. On the other hand, some prospective teachers tended to complain of the difficulty in finding the time and place for their Classroom Projects.

Students' Evaluation of the Class:

The standard UCDQ-II form was used for class evaluation. On the 20 standard questions asked, this class was rated above average (for both the College and the University) in the positive direction for six items. These items were (on a five point scale): organization (3.32), interesting topics (3.50), interesting style (3.46), appropriate level of materials (3.5), instructor's enthusiasm (3.89), and presentation holds my interest (3.25). Written comments also supported the positive ratings in these areas. The students who gave ratings that fell below average (for the College and the University) indicated that they felt the class was somewhat demanding (1.65) and lacked review on difficult materials (2.81), did not include enough discussion (3.04), and did not motivate the students to do their best (3.07).

Discussion

Despite the fact that some students complained of the time and effort it took to conduct the Classroom Project, most of the students considered the experience meaningful and significant (78% rated the Classroom Project to be important or very important). It appeared that those who were currently teaching benefited from the Classroom Project more than those who were prospective teachers who found it hard to find time and to locate a suitable classroom to implement the project. Perhaps this model would be suitable for an in-service training for school teachers. Those who have not taught may need a different way, such as a more structured and convenient laboratory setting, to practice the skills of classroom discipline.

A class like this demands an extraordinary amount of time from the instructor to devote to individual project consultation. In addition, the class was taught at night and most of the students could only come for consultation on the evening of the class, which made scheduling of consultations difficult and rushed. It would have been easier if the enrollment for this class was limited to 15 current teachers or 15 prospective teachers when field projects were part of the class, and when theories and applications were the dual emphases.

While the practical part of the class appeared to be more successful with current teachers, the theortical part of the class seemed a bit too demanding and difficult for some current and prospective teachers. When one third of the class instructional time was devoted to project presentations and discussions, there was hardly enough time left to cover relevant theories. More efficient ways of teaching theoretical materials in less time need to be explored along with this model. Furthermore, it still remains as a challenge to find ways to provide practical experiences for those who have not taught, do not find time to get into a classroom until their student teaching, and are in dire need of classroom discipline skills. Educators continuously have to seek better methods of teaching, researching, and bringing theories and applications closer together for our students.

References

Axelrod, S. (1977). Behavior modification for classroom teachers. New York: McGraw-Hill.

Bandura, A. (1977). Self efficacy: Toward a unifying theory of behavioral change. Psychological Review, 84, 191-215.

Canter, L., & Canter, M. (1976). Assertive discipline: A take-charge approach to today's education. Seal Beach, Calif.: Canter & Associates.

Charles, C. M. (1985). Building classroom discipline: From model to practice. New York: Longman Inc.

Dreikurs, R. (1968). Psychology in the classroom (2nd ed.). New York: Harper & Row.

Elam, S. M. (Ed.). (1978). A decade of Gallup Polls of attitudes toward education, 1969-78. Bloomington, Ind.: Phi Delta Kappa Center on Evaluation, Development and Research.

Ginott, H. (1971). Teacher and child. New York: Macmillan.

Glasser, W. (1965). Reality therapy: A new approach to psychiatry. New York: Harper & Row.

Gordan, T. (1974). P.E.T.: Parent effectiveness training. New York: Peter H. Wyden.

Jones, F. (1979). The gentle art of classroom discipline. National Elementary Principal, 58, 26-32.

Kounin, J. (1977). Discipline and group management in classrooms. New York: Holt, Rinehart & Winston.

NEA (1976). Nationwide Teacher Opinion Poll. Washington, D.C.: National Educational Association.

Phi Delta Kappa (1985). Discipline. Bloomington, Ind.: Phi Delta Kappa

Center on Evaluation, Development, and Research, Hot Topics Series.

Royer, J. M., & Perkins, M. R. (1977). Facilitated transfer in prose learning over an extended time period. Journal of Reading Behavior, 9, 185-188.

Watson, D. L., & Tharp, R. G. (1985). Self-directed Behavior (4th ed.). Belmont, Calif.: Brooks/Cole.

LEARNING FROM LEARNING: NOTES ON WHAT RESEARCH IN RHETORIC TEACHES ABOUT TEACHING

by

Jim W. Corder

Texas Christian University

Jim Corder
Department of English
Texas Christian University
Fort Worth, Texas 76129

LEARNING FROM LEARNING: NOTES ON WHAT RESEARCH IN RHETORIC TEACHES ABOUT TEACHING

The top half of the sheet I have given you (see attached at the end) shows one version of a partial understanding of a bare-bones outline of the rhetoric we inherited from classical, medieval, and Renaissance students, nearly lost in the 19th and early 20th centuries, and have begun to recover in the years since about 1960. Perhaps the five terms I've used can be better displayed in a ordinary human sentence: Every statement (and let statement mean any utterance from a Fragment to a speech to a poem to a letter to a scientific theory to a code of law and on)--every statement comes from somewhere or has an inventive past, takes on and reveals some kind of structure, emerges to us as a style, reaches toward some audience (even if only the author), and occurs on some occasion. Whatever our conviction or attitude, we cannot escape rhetoric. We cannot wholly repudiate our past or think without thinking in the ways that we and others have thought or elude the evidence of our senses and of research--necessity really is the mother of invention. We always invent, either deliberately and meditatively or accidentally as we acquiesce in the thought and language of others. We cannot avoid structure; even what we imagine to be an unstructured experience will be converted to a structure in the mind of some participant. We cannot be style-less; we will reveal ourselves, even if accidentally or unpleasantly. An audience always exists, now or later, and there is always an occasion for what we say, however trivial or significant it may be.

Each of the terms I've named represents human processes that are wonderfully reciprocal and continuous. Nothing is ever over. We do not think (invent) and then speak or write; the inventive process continues, shaping the structure and style we make, the audience we reach for, the occasion we serve; and structure, style, audience, and occasion, in turn, are continuously informing our inventive processes. And rhetoric contains both the perils and the best hopes for the human condition. Invention is an invitation to openness; it is by its nature a process of roving, exploring widely, plumbing deeply. Everything waits in aid of invention. But openness can become a prison; if we insist upon being open, we cannot speak. Our mouths will say only one word at a time. When we begin to speak, we have, willy-nilly, made choices. Invention is a call to openness, but structure and style are closures. Closure can be peril, too; at its worst it appears in unthinking surrender to dogma and tyranny. We often restrict ourselves to a single view, failing to reach for the riches of invention, trusting solely to such endowments as we already have. We often fail to make any discriminations at all, arriving at a foolish openness. But a beauty waits: invention is an invitation to openness, but structure and style are closures. Rhetoric asks us to be perpetually open and always closing, and that's as good as a model as I can presently imagine for the examined life.

But I have to correct myself before I go on. There is no "rhetoric," if by that term we mean a single, satisfactory system for human thought and discourse. The terms I have used and all the terms found in rhetoric and composition textbooks form a language--a metarhetoric, if you please--for talking about a multitude of rhetorics. A rhetoric grows along with available languages, with epistemological conceptions, and with our views of our own nature. Any culture, any single soul contains the possibility of various rhetorics. Insistence upon a single rhetoric, a "right" rhetoric is, at worst, dogma and tyranny; it is, at least, pedagogy gone haywire, as, for example, in much of the "back-to-the-basics" movement we have been afflicted with in the past 10 years. I want to mention briefly a few things I think I've learned from studying rhetoric, and then linger a little over what rhetoric suggests about curriculum design.

I like to think that studying rhetoric has enabled me to learn a little about teaching. The continuous rhetorical process I described briefly a moment ago leads me to think, for example, that students need us as editors, not as police officers, and they need to do their work in a genuine open process. In general, I'd rather say, not "This won't do--you make a C or an F," but "Look, you've tried it this way; now let me show you a couple of things and then why don't you try again." There are times, I suppose, when we all should be brought to the mark, but when it's possible, we should expect students to work, revise, re-work. Students all too seldom have the privilege of continued thinking and re-working; that is to say, they seldom have the chance to work as practicing scholars.

I've learned from studying rhetoric that short-answer examinations (multiple-choice, true-false, fill-in-the-blank) are a violation of education. I think I understand their uses and our need for them, but when we give such exams, we are requiring that students forego learning to speak in their own voices and we are denying them their proper responsibility for organizing knowledge, for inventing, creating structures, and realizing styles.

I've learned, too, I think, by studying rhetoric to understand a little better the distrust that faculty members sometimes feel toward administrators. It happens, I think, because administrators cease teaching. I don't mean to suggest that they should stay in the classroom--there are many places for teaching. Most faculty members seldom hear administrators speak except on ritual, ceremonial occasions, where the focus of their attention is typically on the present. They speak a present rhetoric, an epideictic rhetoric; they infrequently reveal their past thinking in judicial rhetoric, and so we have no context for their infrequent legislative rhetoric about future expectations. Good teaching explores the past and reveals it, displays and contemplates the present, and plans for a future. Bound too often by the demands of their work to a ceremonial present or an expedient present, administrators too seldom get a chance to teach.

And I've come to think, too, that all of our subjects and disciplines are rhetorics. That is, they are created, named, spoken, written sets of information, insight, and perspective, realized at given times by given people thinking in the ways that their time and place make possible. Our disciplines are not precious, eternal, and determinate. They are not fixed bodies of knowledge to be "covered." And that leads me to what I most wanted to talk about, curriculum design--specifically core curriculum design--as teaching.

I gather that most of us do not often think of the curriculum itself as a form of instruction, but I think it is. Before we ever see our students, we have announced to them, through our catalogues, what we think it is important for them to know, and we have predicted a structure of knowledge for them. This is especially true when we announce general requirements or a core curriculum, the focus of much recent discussion and disorder.

Once upon a time, we like to think, educational vision was clear and, being clear, gave a lovely coherence to curriculum design. Perhaps. Sometimes it's nice to think so, though mostly a mistake. Ernest Boyer ("The Core Curriculum: A search for Commonness," Liberal Education, Fall, 1980, p. 277) describes a clear moment:

> . . .the College of William and Mary, this nation's second college, was chartered to do three things: to provide pious education in good letters and manners; to train students for the ministry; and to convert the Indians.
>
> To achieve these goals a core curriculum was required that included Latin and Greek, rhetoric, logic, ethics,

> physics, Aramaic, Syriac, history, botany, mathematics, scriptures, Hebrew, and catechism.

Though none at the time may have doubted it, even that coherent curriculum was in disarray. I expect that if you tilt your head and look a little aslant, you'll see that educational curricula are always in disarray. Since about 1975, many have thought them chaotic, fallen from a lovely coherence into prideful independence and belief in our uniqueness, foul attitudes that eroded established core curricula so that, as Boyer puts it, "general education languished and died largely because the commonality of self triumphed over the commonality of substance. . . . Today the only thing we seem to have in common is our differences. There is no widely shared social vision, and there is no agreement about what it means to be an educated person. On many campuses required courses have been dropped, and the ones which remain reveal a staggering incoherence of purpose" (p. 278). Everyone seems to be righteous about the matter, and the righteous do carry on. Georgie Anne Geyer wrote not long ago in her column about the intellectual breakdown in our society (**Fort Worth Star Telegram**, February 25, 1985, p. 8A): "Signs of that breakdown are everywhere. American universities and colleges have allowed their curricula to slip into a dangerous state of disarray and incoherence, away from the basic studies of mankind."

Some recent studies, of course, have been thoughtful, useful, and responsible. Often, however, attacks upon current college curricula and calls for reform seem based on a kind of quirky homesickness for a place that never was. Apparently convinced that general education is no longer an introduction to and immersion in the best that has been thought and known and is now a collection of disconnected and often eccentric areas of inquiry, the authors of various commentaries fall into a nutty nostalgia, however, is what I take to be an astonishing lust for authority in the continuous calls for consensus, unity, coherence, and for authority itself, most especially in William Bennett's disgraceful **To Reclaim a Legacy**. Those who are strident for authority seem not to remember that the ground and hope for learning is freedom--not the satisfaction of some consensus, some unity, some coherence, some authority. In the sub-text of calls for clear goals, precise aims, predictable outcomes, appropriate proficiencies there is a declaration for authority. I wish, instead, that we would declare for the autonomous learner in continuous passage.

Authority, however, will not be escaped. A university declares itself an authority by declaring itself a university, by offering one curricular set as opposed to another one. We can, nevertheless, sit lightly in such authority. One way to do that is to prize ourselves (students and faculty) as much as we prize the sacred icons and objects of our disciplines, to cherish human ways of thinking and being in the world as much as we cherish the sacred canonical texts. In **Literacy and the Survival of Humanism** (Yale University Press, 1983), Richard Lanham suggests that we might design curricula "from the inside out, as a training in self-conscious motive, and not, as with a list of set texts that 'guarantee' liberation, from the outside in" (p. 9), that we might provide conceptual frameworks allowing students "to find, and to create, some order among the humanistic disciplines" (p. 141).

In addition to the lust for authority I have mentioned, another problem lies at the center of much recent agitation and lamentation. Recent commentators, critics, and reformists are still depending, as we all do and have, upon their hopes for a wise canonical curriculum--that is to say, they put their hopes in "covering" appropriate bodies of knowledge, or "exposing" students to an appropriate set of works, as if to the measles. A curriculum that proposes to "cover" given canons is destined for fragmentation, for imperfection, however much some of us may want to prize curricula of the past.

We hope, of course, to save the great texts, to perpetuate what is dear, too. Perhaps we can learn to study the canonical texts, not as treasures to be adored, but as enabling capacities. A different hope waits in the design and enactment of conceptual curricula, which take their shape from templates of human learning, cognition, thought, and may take their justification in awakening human capacities rather than in fingering artifacts. A curriculum cannot by its invitation to learning and performance, taking pains through all involved to assure that coherence will always give way to discovery and excitement.

I'd ask you, then, to consider a conceptual, not a canonical, curriculum. I propose as a sample something that looks like what is shown at the bottom of the sheet I handed out:

Stage 1: WORLD VIEWS AND INFORMING PREMISES
Studies of selected complete works from diverse fields, from written works of antiquity to electronic forms of today, representing a variety of world views both scattered and systematic, designed to explore the ways in which premises and assumptions and philosophies inform and shape discourses

Stage 2: MODES OF THINKING IN HUMAN DISCOURSE
Studies of further complete works as above, the studies now concentrating on how people think; some recapitulatory study of texts from previous stages

Stage 3: USES OF THE PAST
Studies of further complete works as above, the studies now concentrating on how we appropriate, exploit, reconstruct, or reject the past; some recapitulatory study of texts from previous stages

Stage 4: RELATIONSHIPS AND DISTANCES IN DISCOURSE
Studies of further complete works as above, the studies now concentrating on discovering relationships among writers/speakers/artists/performers, subjects, and audiences; some recapitulatory study of texts from previous stages

Stage 5: STRUCTURES IN HUMAN PERFORMANCE
Studies of further complete works as above, the studies now concentrating on understanding structures in human performance; studies might include epic and tragedy, comedy and satire, novelistic forms, extended to include television and cinema, referential forms, including scientific, historical, and social texts, expressive forms, from lyric poems to advertising, and persuasive form, including didactic poetry, oratory, advertising, essays; some recapitulatory study of texts from previous stages

Stage 6: STYLE AND IDENTITY
Studies of further complete works as above, the studies now concentrating on the relationship of style and identity and on the nature of diverse styles in various modes, including the ways in which assumptions, world view, modes of thinking, uses of the past, relationships, and structures manifest themselves in styles; some recapitulatory study of texts from previous stages

Stage 7: OCCASIONS IN HUMAN DISCOURSE
Studies of further complete works as above, the studies now concentrating on understanding diverse occasions for discourse and performance; some recapitulatory study of texts from previous stages

Notice, please, certain features of this proposed core curriculum:

1. No faculty member is automatically excluded:
2. No subject matter is automatically excluded;
3. No discipline is automatically excluded; note, for example, that music, biology, painting, chemistry, political economy, and architecture can be studied through this framework as easily as, say, literature;
4. The scheme predicts a cumulative effect;
5. The scheme calls for connections, each stage recapitulating previous stages; and
6. The scheme is flexible: each stage might be a series of modules designed to accompany traditional departmental courses.

In my mind, I justify this as a conceptual curriculum because it parallels pretty closely certain natural, probably inevitable, patterns in the formation of speech and writing, thus thought. All human performances come from somewhere (from given views and assumptions, from found modes of thought, from various uses of the past, from various relationships, from the diverse inventive worlds we inhabit); this is reflected in Stages 1-4. Coming from somewhere, all human performances take or create some kind of structure, as in Stage 5. Coming from somewhere and becoming structures, all human performances are known to us as styles (see Stage 6) and occur on some occasion (see Stage 7). The curriculum does not propose to cover specified canons of knowledge; it is an invitation to faculty and students to explore deliberately what we are always being and doing anyway, an invitation to make rhetoric.

I should mention two other features of this plan that I consider to be important.

First, while I think this curriculum ought to rest upon a set of new courses specifically designed to fit, it does not require exclusively new courses. If we charted all traditional departmental courses against the concentrations I have suggested --excluding no course and no department--we might discover that the forms of study I have indicated can be gathered into a core curriculum from diverse existing courses, including some we had not thought previously to consider, e. g., History of Education, Philosophy of Science.

Another dimension of this core curriculum is proposed in what I have already suggested. Our best intentions and surest wisdom notwithstanding, we still tend to treat our subjects and our courses as if they were finished things, probably handed down in stone with the Ten Commandments, the tenth of which is "Thou shalt preserve all existing academic departments." We forget that chemistry is poetry, that psychology and biology both issue from and create given views of human nature, that history is the continuing argument about our identity, that managerial skills do not exist without a prior conception of the uses of language. I suggested a moment ago that I had borrowed this conceptual framework from what seems to be certain natural, probably inevitable, patterns of speech, writing, thought. Given this as a start, we might learn to remember that all forms of human study and performance are discursive practices in progress, their nature unfixed and rhetorical. With work and a little luck, I mean to suggest, we might get in the habit of remembering that the pronoun I is the subject of every sentence, typically unspoken, and the typically unspoken verb is a word like see or say or believe. If I say, "The curriculum needs revising," what the sentence says is, "I see that the curriculum needs revising." A first-person-singular pronoun is buried in every declaration including scientific statements, as Walker Gibson reminds us:

> The first purpose of a general education is to alert the student to the implied human subject in the syntax of every sentence. To take this purpose seriously would revolutionize teaching, as well as provide common ground for all the interdisciplinary coherence one could stand. . . . If we are conscious of this we are conscious, for once, of our own roles as creators of the world. . . . To reform the undergraduate curriculum is to try to keep that consciousness alive. How to present our histories and sciences and arts in such a way that no statement ever stands alone, divorced from its human creator? That is the problem. It is not unsolvable, but solving it will do a lot of damage to our multiple-choice, hour-examin, term-paper kind of teaching ("The Knowledge of Human Minds," **Chronicle of Higher Education**, April 17, 1978, p. 48).

I think I should announce that I don't expect this core curriculum to be enacted anywhere tomorrow. I'd despair if it were, for that would mean that someone had taken what I meant as a provisional notion to be shared as, instead, a finished, authoritative plan to be declared into existence. I offer it, please understand, as a piece of jackleg work. Jackleg work may be defined as that kind of work upon the completion of which the worker backs off, surveys the project, and says, "Well, there it is, by God--it ain't much, but it might hold until we can think of something better."

Invention	- includes, for example, study of the practices other speakers/writers; practice in examining situations, occasions for discourse; exploration of how other speakers/writers have approached audiences and practice in various modes of taking a subject and a view toward an audience; INVENTION is a speaker's/writer's history brought to focus for exploration and discovery
Structure	- governs meaning
Style	- carries, reveal identity
Audience	- even if only one, or only the self
Occasion	- Judicial (about the past), epideictic (about the present), legislative (about the future)

---

1. WORLD VIEWS AND INFORMING PREMISES
2. MODES OF THINKING IN HUMAN DISCOURSE
3. USES OF THE PAST
4. RELATIONSHIPS AND DISTANCES IN HUMAN DISCOURSE
5. STRUCTURES IN HUMAN PERFORMANCE
6. STYLE AND IDENTITY
7. OCCASIONS IN HUMAN DISCOURSE

HOW ONE THINKS: EXPLICATION OF A LEARNING MODEL

by

Linda Scott DeRosier

The College of Idaho

Many of those who have been teaching or writing about learning have long relied upon a definition of learning as mastery of data which could be tested against objective criteria. Such a definition has been challenged by Piaget's view of learning as a developmental process. Thus, for the constructionists, Piaget is a good guy; to the traditionalists, he is a bad guy.

Since I number myself among those who view Piaget as one of the "white hats", the purpose of this paper is to explicate Piaget's learning model in light of the insights of George Herbert Mead and Friedrich Nietzsche.

Piaget has attempted to describe some of the complexities of the conceptual world of the individual by providing a model which is of assistance in understanding the learning process. This paper will attempt to go beyond Piaget's description to an explication of this process, made possible through the examination of his learning model, in combination with the ideas of Mead and Nietzsche. Such an approach involves the conceptual definition of the aspects of the learning process which Piaget termed equilibrium, disequilibration, assimilation and accommodation.

Piaget defines equilibrium as that state of balance between assimilation and accommodation, toward which all cognitive functions tend. In the state of equilibrium, the individual's understanding of his environment is such that he has achieved a state of satisfaction, signifying his feeling of control in coping with his environment. At this point, the individual perceives no phenomenon in his world which is at odds with his conceptual framework or cognitive map; although he is aware of the existence of phenomena, of which he has no understanding, he does not place value on the necessity of understanding such phenomena.

Piaget has stated that the individual arrives at this "feeling of necessity" as soon as he has understanding of a phenomenon, such feeling of necessity arises from completion or closure of a structure.[1] In his words:

> "It is an idea which is constructed at the same time as the overall structures. As soon as a structure is sufficiently complete for closure to occur, or, in other words, once the internal compositions of the structure become interdependent and independent of external elements and are sufficiently numerous to allow for all types of arrangements, then the feeling of necessity manifests itself".[2]

Thus, the individual dwells in the state of equilibrium, although he is surrounded by potential stimuli. These potential stimuli are subconsciously rejected by the individual for a variety of reasons; some are rejected because his conceptual framework cannot assimilate them (i.e. his resources are not adequate to deal with their complexity); others are rejected because they pose no problem to him (i.e. he has already succeeded in the understanding of like phenomena in past experiences).

However, in the view of G.R. Lefrancois,

> "equilibrium signifies more than a simple balance, it is a state of development with respect to mental structures where external development can be compensated for within the system of structures without either destroying the essential logical properties of that system or distorting the reality which is being reacted to. Equilibrium can, therefore, be seen as a motivational concept of first importance in the Piagetan system. Insofar as there is a need to maintain some sort of equilibrium - in other words, a need to understand the environment and to reduce external disturbances - the individual will continue to function as long as he is in a state of disequilibrium. And just as important from a motivational point of view is the thesis that this functioning will be aimed toward the elaboration and stabilization of structures in equilibrium".[3]

If Lefrancois' view is correct; namely, that the struggle to maintain equilibrium is a motivational concept, then we must focus, at least briefly, on the question of impulse - or, to use the language of Lefrancois - the question of motivation. Nietzsche's concept of the will to power provides a way of pointing to this aspect of the process of intellectual development.

Nietzsche described the will to power as that life-force that seeks control of one's environment so that it is possible for the individual to be satisfied with his world. Such a state of satisfaction prevails so long as the individual encounters situations in which he is confident in his knowledge of how to proceed (i.e. how to deal effectively with the situation at hand). However, when the phenomenon (i.e. person, idea, object) encountered gives rise to feelings of confusion as to how to proceed, the individual becomes dissatisfied with systems heretofore found to be successful methods of dealing with like phenomena. Such a state of discomfort is what Piaget terms "disequilibrium", or disequilibration.

This "disequilibrium" or lack of adjustment between the individual and his world enables the individual to be open to impulse.[4] Given this situation, the individual is sensitive to stimulation of phenomena. Therefore, at the stage of impulse, as outlined in the work of George Herbert Mead, "perception involves an immediate sensuous stimulation and an attitude toward this stimulation, which is that of reaction of the individual to the stimulation".[5] This reaction is not immediately transferred into overt activity; instead it appears in consciousness only as an attitude. Simultaneously, along with this attitude of response, there also appears in consciousness some imagery, based on past experiences, which allows the individual to conjecture as to where response to this stimulus would naturally lead. Thus, the state of disequilibration involves not only an attitude of response to the stimulation, (accommodation), but also the imagery, based on like experiences, of the result of the response (assimilation).

Pierre Janet has attempted to describe this struggle for control of one's environment and the objects/phenomena therein by pointing out the existence of the tension which occurs between individuals as a result of the force of their metalistic energy on each other;[6] and Mollie and Russell Smart state that the perception of a problem, an incongruity or discrepancy involves tension and a feeling of incompleteness, as if something is missing or something is wrong.[7]

Thus, the individual enters the state of perception, which Mead defines as "a relation between a highly developed physiological organism and an object, or an environment in which selection emphasizes certain elements".[8] The phenomena that arouses the activity in the sense organs, which is described in the stage of impulse, are all within the individual's field of experience. In other words, the object or idea that is perceived is not there before the influence is exerted on the sense organs. The individual, the phenomenon and the impulse are all simultaneously there.

Mead further says that the object in perception is a distant object which invites the individual to action with it, which brings up the question "why this object rather than that one?" Robert M.W. Travers has attempted to answer this question by saying that:

> "the perceptual systems have some inherent capacity to extract information from a bewilderingly complex environment, although most of the information has only a transitory life . . . . . The individual is always biased by what he notices and what he rejects and the information is always slanted in the direction of his immediate needs".[9]

The state of disequilibration, then, occurs as a result of a perceived discrepancy between the level of complexity of the schemata of the individual and the complexity of the environmental phenomena in perception. This discrepancy became apparent when the individual attempted to assimilate the new phenomena into his existing schemata (i.e. his existing set of responses, actions, or operations, for dealing with the world).

Assimilation is conceptually defined as the individual's attempt to relate new data, stimuli, or phenomena in perception to his existing conceptual framework. It . . .

> "operates whenever the organism sees something new in terms of something familiar, whenever it acts in a new situation as it has acted in other situations in the past, whenever it invests anything with familiarity (recognition), importance, or value".[10]

This process of assimilation takes place in what Mead has termed the stage of manipulation where the perceiving organism attempts to place the phenomenon perceived within the context of what prior experience has shown to be its place. The individual attempts to analyze perceptual objects by further perception.

In the process of assimilation, then, where an analysis of perception is attempted by the perceiving organism, the individual is not given a reality which lies outside the original or possible perception, in that he is able to see the uniformity of the experiences with different phenomena.

Thus, having found himself unable to fit this new stimuli into his conceptual framework, as it presently exists, the individual tries on heretofore unrecognized modes of dealing with the problem facing him. He dialectically entertains, disposes of, and/or remodels ideas as to a means of resolving his situation; a process Piaget calls accommodation.

The process of accommodation, as defined by Piaget, involves the individual's alteration of existing cognitive structures in order to assimilate environmental stimuli; the modification of existing schemata so that the organism is capable of dealing with the new situation.

In the language of Mead, the individual, in restructuring his thinking to accommodate the new phenomenon, as well as modifying the phenomenon to fit into his conceptual framework, progresses steadily towards the stage of consummation.

Consummation is defined as the full completion of the act which the distance stimulus (the stage of impulse) initiates, thereby bringing the the organism back to equilibrium (or, to use the language of the dialectic, to synthesis).

A cognitive developmental system, as outlined in this paper, which includes the ideas of Piaget, Nietzsche and Mead allows for the construction of a more complete learning mode; one which takes into account not only description but also explication of the learning process.

It would be a mistake to imagine that all four stages of the act take place simultaneously. The stage of manipulation involves bringing the act to a temporary pause while the manipulatory processes are going on (e.g. placing the phenomenon in context, deciding what it is about and how to handle it). This pause affords the opportunity for competing tendencies to response to arise within the act.

The distance stimulus is then approached with manipulatory processes already excited. This attitude of manipulatory response directs the approach of the individual toward the phenomenon. The distance stimulus also arouses alternative manipulations which inhibit one another and the act, while, at the same time, different stimuli compete for setting free the act. Finally, one manipulation or another assumes control of the act, which then becomes directed by this distance stimulus rather than the other enabling the act to be carried through to consummation.

Although Mead originally constructed the stages of impulse, perception, manipulation and consummation to describe human action between the organism and objects in perception, these constructs are of valuable assistance in the expansion of Piaget's learning model in that they provide explication of the phases of learning in areas where Piaget has offered only description.

The significance of the model of the learning process previously outlined in this paper lies in its application in the classroom. If we accept this model as representative of learning, one of the crucial assumptions is that disequilibration cannot be imposed on the individual. It is, instead, the individual's internal response to the stimuli which thwarts his will to power.

Does this, then imply that, since "coming to understand" is an internal process, no one can teach anyone anything? I think not. However, I do think that this view of learning implies significant changes in the traditional role of the teacher, if he is to become a factor in the environment contributing to disequilibration.

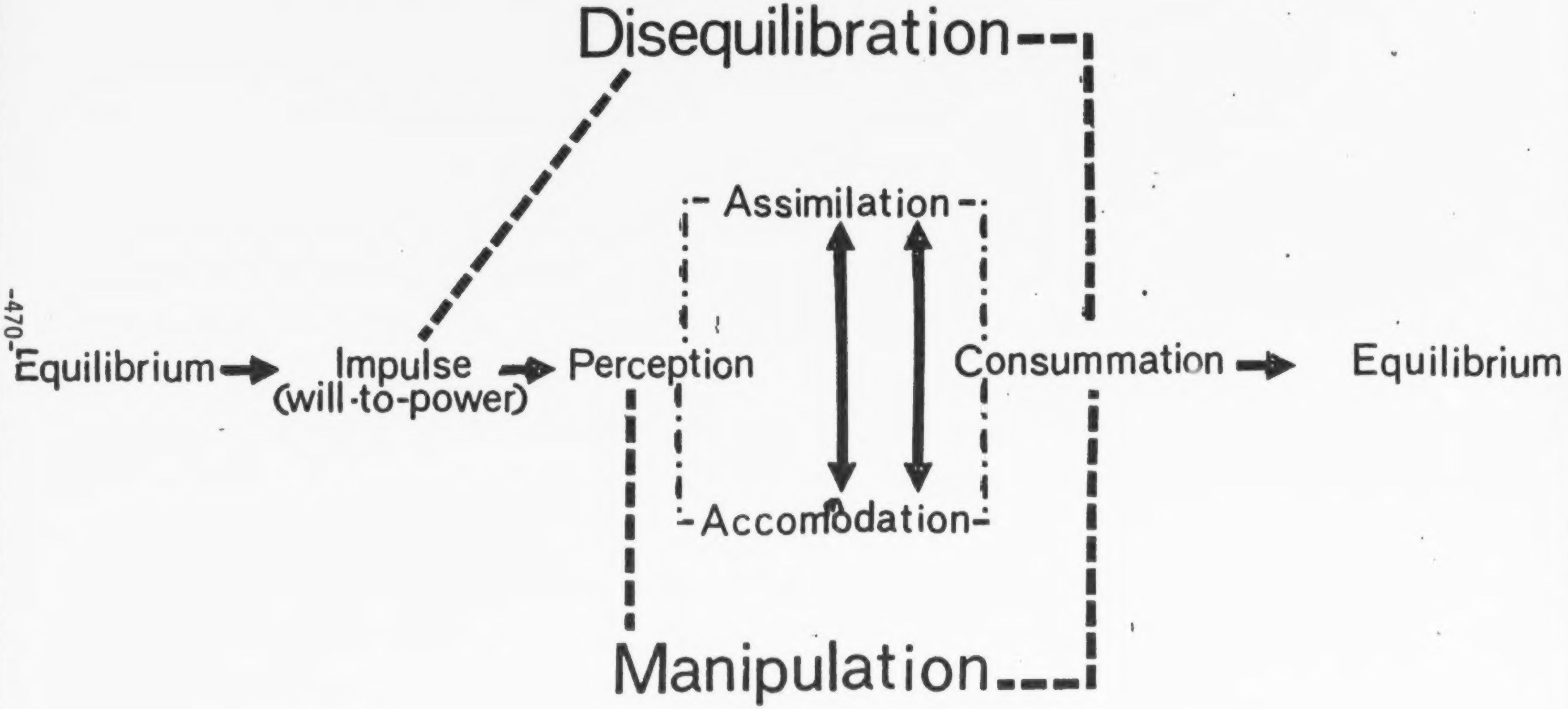
The teacher-as-authority, who enters the classroom armed with objective data which he plans to "teach" the students, whether they like it or not, is not likely to provoke a state of disequilibration in regard to his field of information. Students will simply develop schemes for dealing with the expectations of such a teacher and the learning which takes place will, most probably, be in the area of understanding how to manage the teacher rather than any understanding of the subject matter involved. In fact, most of the learning which takes place in such classrooms, is in the area of dealing with authority (i.e. the student, having less power in the situation, exercises his will to power through increasingly sophisticated manipulative schemes). That such knowledge is valuable preparation for life in this culture is not questioned; instead, the question is, "what are the possibilities for furthering subject matter knowledge at the same time"?

I would contend that our learning model provides some answers to this question in that one of the factors in the provocation of disequilibration is that the idea or material must be familiar enough to the student to engage his interest (i.e. it must have to do with the fulfillment of his immediate needs).[11] In other words, in order for the student to involve himself in the learning process, he must initially see something in the idea which he can relate to his life.

Thus, it becomes necessary for the teacher to have some idea, to use the language of my students, of where a person is "coming from". The teacher must be interested enough in the lived-world of his students to engage them in dialogue in an attempt to see the objective data he is teaching from their perspective, thereby enabling him to relate the subject matter to their lives.

By contrast, the teacher must also deal with increasingly complex issues so as to give the students opportunity to grow in their ability to understand ideas. If the teacher engages his students in dialogue as equals in the learning situation, the absence of threat (always present in the teacher-as-authority role) enables students to critically analyze ideas and come to understand them; whereas in the authoritarian classroom the students are more likely to simply memorize answers told them by the teacher.

It is my contention that the ideas of Piaget, Mead and Nietzsche give us a model for understanding the process of learning. The subsequent task is to structure our classrooms so that we, as teachers, can take advantage of our knowledge of learning process by developing ways of dealing with students based on egalitarian rather than authoritarian teacher roles.



Disequilibration

Assimilation

Equilibrium → Impulse (will-to-power) → Perception

Consummation → Equilibrium

Accomodation

Manipulation

NOTES

1. Jean Piaget, "The Theory of Stages in Cognitive Development", *Exploring Human Development*: *Interdisciplinary Readings*, Harold W. Bernard and Wesley C. Hickins, eds., (Boston: Allyn and Bacon, Inc., 1972). page 120-121.

2. *Ibid*., page 121.

3. Guy R. Lefrancois, "Piaget's Developmental Model: Equilibration-through-Adaptation", *Developmental Psychology*: *A Book of Readings*, William R. Looft, ed., Hinsdale, Illinois: The Dryden Press, Inc., 1972), page 301.

4. For a fuller statement of this position consult *The Philosophy of the Act* by George Herbert Mead (Chicago: The University of Chicago Press, 1938).

5. *Ibid*., page 3.

6. Robert D. Watson, "Janet, Pierre", *International Encyclopedia of the Social Sciences*, 11th ed., II, page 234-235.

7. Mollie S. Smart and Russell C. Smart, *Children*: *Development and Relationships*, (New York: The Macmillan Co., 1972), page 642.

8. Mead, *op*. *cit*. page 8.

9. Robert M.W. Travers, *Educational Psychology*: *A Scientific Foundation For Educational Practice*, (New York: The Macmillan Co., 1973) page 80.

10. *Ibid*., page 80.

11. *Ibid*., page 80.

TEACHING FOR THE FUTURE WITH ALGORITHMS, LEARNING MODULES, AND MICRO-COMPUTERS--AN ACCOUNTING EXAMPLE

by

Manson P. Dillaway

New Mexico State University

TEACHING FOR THE FUTURE WITH ALGORITHMS, LEARNING MODULES, AND MICRO-COMPUTERS--AN ACCOUNTING EXAMPLE

Manson P. Dillaway, Ph.D., CPA
Department of Accounting and BCS
New Mexico State University

Most instructors of an upper division undergraduate accounting course will verify that a frequent and earnest student reaction to the course is that too much material was covered in too little time. A common complaint might be that in every class meeting entirely fresh material was presented, leaving little room for repetition and insufficient time for open-ended class discussion. A byproduct of these student perceptions, which becomes shared knowledge, is that many prospective accounting students develop notions that (1) accounting is extremely difficult to master, (2) success depends upon a prodigious ability to memorize, and (3) accounting as a career option should be avoided by all except those who excel in intermediate accounting. These notions are invalid. Accounting is based on a simple, basic equation [Hermanson, et al., 1986, p. 20]; although, admittedly, certain components are difficult to define. Success will depend upon an ability to discover reusable principles from examples and an ability to recognize the substance of transactions--not memorization of rules for every possible situation.

Part of the difficulty in teaching accounting is due to the traditional teaching method used--the illustrative method [Ijiri, 1983, p. 169]. In this method, adopted by most textbooks and followed by many instructors, complete examples are presented to the student, the student induces underlying rules from the examples, and then the student works out solutions to assigned problem materials. This is an effective method of teaching, but it often leaves the student unable to communicate nearly as well in the abstract (in spite of the rules induced) as with additional examples [Ijiri, 1983, p. 170].

This teaching method may be at or near the breaking point in effectiveness in courses such as intermediate accounting, cost accounting, and individual income taxes, because too many examples must be assimilated before a student is able to obtain the breadth and depth of understanding that we typically aim for. For instance, West's Federal Taxation: Individual Income Taxes [Hoffman & Willis, 1984] contains 727 numbered examples within its 20 chapters, most of which would be covered in a typical one semester course. In addition, following each chapter is a large number of questions and problems (typically, more than 50) which further illustrate the chapter contents. Only those students who are able to formulate abstract rules are not overwhelmed by the numerous examples.

Fortunately there is some potential relief for students (and instructors) in the pedagogical process for accounting. It would take the form of a major change in the way material is presented and it could, as a byproduct, enable a much more thorough integration of computers into the learning process. This relief is possible with a basic change in emphasis away from the illustrative method and toward algorithm-based learning modules.

Accounting Algorithms

Algorithms have been implicitly used by accounting instructors for quite some time. This has been through the illustrative (problem-solving) approach. When the student is able to identify, inductively, the algorithm demonstrated through the problem material, additional problems may be solved with relative ease [Umapathy, 1984, p. 137]. Making the algorithm explicit, whether in the form of a decision-tree, flowchart, formulated worksheet, or computer program, should give the student a breakthrough without necessarily reducing the quantity of topics covered or the depth of the coverage. Umapathy (1984, p. 137) suggests students can learn to use an algorithm with negligible external assistance if check figures for critical steps in solving a problem are also provided.

An example of a simple algorithm in statement form follows. It is based upon the special deduction available to working couples to alleviate the "marriage penalty." The special deduction is 10% of the lesser of (a) $30,000 or (b) the qualified earned income of the spouse with the least earned income [IRC Sec. 221 (a)(1)]. A typical example that could be solved with this algorithm would be to compute the special deduction for a married couple, H and W, having earned income of $18,000 and $22,000, respectively. Their working couple deduction would be $1,800 (10% of $18,000). If their salaries were $48,000 and $52,000, respectively, their working couple deduction would be $3,000 (10% of $30,000). This particular algorithm is quite simple and presenting it to students in the form used above in reading material or in a class lecture should be sufficient coverage without further illustration.

Teaching with explicit algorithms may take two forms: reception learning of generalized algorithms and computer-assisted discovery learning of accounting algorithms [Bentz, 1974, p. 215]. Bentz [1974, p. 216] cautions that with the reception learning method, where algorithms are presented in a general form and then applied to a series of problems, (1) students are not required to think about the algorithm, (2) students may wind up with only a preverbal understanding of the algorithm, and (3) students may not be as motivated as they would be if challenged with a puzzle to solve. Discovery learning of accounting algorithms, however, has as its goal the construction of an algorithm to solve problems of the type being studied [Bentz, 1974, p. 217]. The algorithm may be specified in many forms, including computer programs. Bentz [1974, p. 217] argues that some of the benefits of the latter form, from an instructional standpoint, are (1) better motivation due to feedback in the algorithm construction stage, (2) inherent satisfaction in the task itself, and (3) better understanding of the accounting procedure due to the higher level of abstraction necessary to produce the algorithm. An example of the algorithmic approach for the individual income taxes course follows.

Table I is a list of many of the algorithms presented in a typical one semester course in individual income taxes. This list approximates what instructors would cover in such a course. As in all matters of curriculum content, there exist differences of opinion and, perhaps, this list would not be regarded as completely acceptable by everyone. Also, certain of the listed items really cover a set of related algorithms as opposed to a single algorithm. Income averaging, for instance, includes two different methods. The major instructional question in teaching individual income taxes using an algorithm-based approach concerns whether to employ the reception learning method or the discovery learning method (with or without computer assistance). Many of the algorithms are simple enough to require only the reception learning method. Refer back to the working couple deduction example. Mere presentation of the algorithm should provide students with the highest level of abstraction, precluding further effort. The same should hold true for many other algorithms on the list: self-employment tax, group-term life insurance inclusion, investment interest, and capital loss deduction, for example. In general, the more complex the algorithm, the greater the benefit of using the discovery learning technique. As a practical matter, time is a constraint to the use of the discovery method since the student will have to formulate the algorithm--a potentially time-consuming process.

Learning Modules

For a conventional university course held over a fixed time period, such as one semester, the course may be broken down into modules. These modules consist of: a title, behavioral objectives, tests of absolute performance,

TABLE 1

Partial List of Tax Algorithms for Individual Income Taxes

A. Taxes and Credits

1. General individual tax formula
2. Self-employment tax
3. Income averaging (5 yr. and 10 yr.)
4. Alternative minimum tax
5. Investment tax credit
6. Earned income credit
7. Child and dependent care credit
8. Tax credit for the elderly

B. Gross Income Inclusions, Exclusions, and Nature

1. Netting process for property gains and losses
2. Annuity income exclusion
3. Group-term life insurance inclusion
4. Unemployment benefit inclusion
5. Installment sales income
6. Vacation home rentals
7. Recapture as ordinary income (Sec. 1245, etc.)
8. Gains from subdivision of realty by a nondealer
9. Postponed gains (Sec. 1031, etc.)
10. Alimony inclusion and exclusion

C. Deductions

1. Moving expense
2. Investment interest
3. Charitable contribution amounts (ordinary income property, capital gain property)
4. Charitable contributions limitations (50%, etc.)
5. Medical expense
6. Casualty and theft losses
7. Auto expenses for business transportation
8. Entertainment facility dues
9. Long-term capital gain deduction
10. Capital loss deduction
11. Working couple deduction

D. Special Deductions for Businesses

1. Cumulative adjustment for accounting changes
2. Bad debt expense (reserve method)
3. Cost of sales under dollar-value LIFO
4. ACRS
5. Depreciation, depletion, amortization
6. Compensation limits under qualified pension and profit sharing

and instructional method alternatives and resources [Bourque, 1974, p. 263]. Table 2 is a possible set of modules for an individual income taxes course.

Table 2

Modules for Individual Income Taxes

		Weeks
A.	Introduction to Taxation	1
B.	Tax Computations	1
C.	Gross Income	2
D.	Personal Deductions	2
E.	Employee Expenses	1
F.	Business Income and Deductions	3
G.	Property Gains and Losses	3
H.	Tax Credits	1
	Subtotal	14
	Testing	1
	Total	15

Table 2 is arranged for a fifteen week course, which incudes one week for testing. For each module, the instructor should develop an outline which includes the topics and their interrelationships. This outline will include all of the relevant tax algorithms. For instance, Module C, Table 2 (Gross Income) might include all of the algorithms from set B (Gross Income Inclusions, Exclusions, and Nature) except, perhaps, items 1, 7, 8, and 9. The latter might be more conveniently covered in Module G (Property Gains and Losses). The order in which the modules are listed in Table 2 is also not definitive. Many instructors would change it to suit their needs.

Integration of Computers into Individual Accounting Courses

Injiri [1983, p. 168] predicts that "by the end of the 1980s, personal computers the size of a standard textbook will be as popular in classrooms as calculators are now." Perhaps in recognition of this trend, the AACSB, in their interpretations of standards for accounting programs, states that students are expected to use the computer in accounting courses (AACSB, p. 44).

There is substantial research support for integrating computer applications into accounting courses. Stone [1974, p. 29] lists the following categories into which computers may be used in accounting education:

1. canned programs;
2. computerized cases and practice sets;
3. games and simulated environments;
4. computer aided instruction;
5. data-based systems; and
6. student-developed programs.

Canned programs enable the student to solve data-rich problems without extensive background in programming or, for that matter, of the analytical techniques necessary for solving the problem. An obvious situation in an accounting course where a canned program might be used is to solve a comprehensive tax return problem. Outslay, et al. [1983, pp. 431] suggest a framework for such problems. These problems may be introduced early in the course (even used with the introduction module) if they are not too complex. Subsequent examples may be designed for use following each module to reinforce the particular material from the module.

Computerized cases and practice sets are special purpose canned programs, specifically related to problem materials in hard copy [Stone, 1974, p. 292]. Most of the textbook publishers offering accounting texts either currently have or plan to publish student workbooks, supplementing their texts, which provide computer problems and cases.

Business games have been widely used with computer simulations in management courses. In the accounting curriculum, these techniques could be readily adapted to tax planning cases in individual income taxes. This is also, incidentally, the area in which many instructors skimp, since they are under continuous time pressure to cover voluminous sets of examples related to tax compliance. Tax planning exercises with a computer might provide the challenge that some students find missing in individual income taxes.

Computer-aided instruction and data-based systems probably are inapplicable to this discussion since the emphasis has been on upper division study in a classroom setting. However, it should be noted that computer-aided instructional techniques, which have been experimented with widely for elementary accounting courses, may be applicable to those upper division courses which contain a large number of short steps or procedures which the student should be led through.

Student-developed programs are a natural choice in any course where discovery learning of accounting algorithms is specified. For instance, an instructor in a tax course might assign his students the task of writing a program to show the maximum annual writeoff in each year of the life of a new piece of five-year ACRS property, acquired in 1985, to include each of the following: availability or not of the Sec. 179 expense, use of statutory percentage or straight line method, use of extended life options with the straight line method and use of the maximum or reduced investment tax credit.

Recent research in the use of computers in accounting education has tended to suggest positive benefits from existing computer applications. Friedman [1981, p. 142] found significantly higher scores in the AICPA Achievement Test (Level II) for students in an intermediate accounting test group which used the computer as a problem solving tool as opposed to the control group taught in the conventional manner. Groomer [1981, p. 940] asserted that evidence from three experiments suggested strongly that introductory students using PLATO (Programmed Logic for Automatic Teaching Operations) performed better than those who used a human tutor.

The Committee on the Role of the Computer in Accounting Education [1970, p. 37] recommended that it is both desirable and feasible to blend the computer into the portions of accounting education relating to analytical techniques and problem solving. Thomas [1984, p. 32] found that as of the

Spring of 1983, 31% of the AACSB schools responding to his survey, were using microcomputers in teaching accounting and that this would soon rise to 48%. Duangploy and Melcher [1984, p. 34] fund that the extent of current and future hands-on computer applications in undergraduate courses was 10% and 39%, representing student usage of one to ten hours per week.

Summary

Two alternatives available to accounting instructors who are squeezed for time in a one semester course are (1) to continue to use the illustrative method of learning with a reduced course content or (2) to adopt algorithm-based learning modules and maintain the existing content. An added benefit of the algorithm-based learning method may be the ease with which it will enable the utilization of computers into the curriculum. The selection of the learning modules and the relevant algorithms may still be individually fitted to the particular instructor and student group. Presently available textbooks are readily adaptable to this design. Finally, algorithms may be introduced into the individual income taxes course directly (reception learning) or indirectly (discovery learning). In each method an explicit algorithm is studied and the student's level of knowledge should reach a desirable level of abstraction. Such knowledge should be both easier to retain and to use than memorized examples.

REFERENCES

American Association of Collegiate Schools of Business, Accreditation Council Policies, Procedures, and Standards (AACSB, 1984-85).

Bentz, W. F., "Using Learning Theory to Teach Accounting More Efficiently," in J. D. Edwards, ed., Accounting Education: Problems and Prospects (AAA, 1974). pp. 213-20.

Bourque, D. D., "The Modular Concept of Instruction," in J. D. Edwards, ed., Accounting Education: Problems and Prospects (AAA, 1974) pp. 256-67.

Committee on the Role of the Computer in Accounting Education, "Report of the 1968-69 Committee on the Role of the Computer in Accounting Education," The Accounting Review (Supplement 1970), pp. 29-43.

Duangploy, O. and T. U. Melcher, "Computer Applications in Undergraduate Accounting Courses," Collegiate News and Views (Fall-Winter 1984), pp. 30-35.

Friedman, M. E., "The Effect on Achievement of Using the Computer as a Problem Solving Tool," The Accounting Review (January 1981), pp. 137-43.

Groomer, S. M., "An Experiment in Computer-Assisted Instruction for Introductory Accounting," The Accounting Review (October 1981), pp. 934-41.

Hoffman, W. H., Jr. and E. Willis, eds., Wests Federal Taxation: Individual Income Taxes, 1984 Annual Edition (West Publishing Company, 1984).

Ijiri, Y., "New Dimensions in Accounting Education: Computers and Algorithms," Issues in Accounting Education (1983) pp. 168-173.

Outslay, E., J. R. Robinson, and R. Boley, "A Framework for Utilizing Individual Return Problems in Introductory Tax Courses," The Accounting Review (April 1983), pp. 428-38.

Stone, D. E., "Computer Usage in Accounting Education," in J. D. Edwards, ed., Accounting Education: Problems and Prospects (AAA, 1974), pp. 289-304.

Thomas, A. L., "North American College and University Uses of Micro Computers in Teaching Accounting - 1983 Survey," Journal of Accounting Education (Fall 1984), pp. 31-41.

Umapathy, S., "Algorithm-Based Accounting Education: Opportunities and Risks," Issues in Accounting Education (1984) pp. 136-143.

Hermanson, Roger H., James D. Edwards, and R. F. Salmonson, Accounting Principles, Third Edition, (Business Publications, Inc., 1986).

PREDICTING GRADES IN CHEMISTRY 101

by

Gordon J. Ewing

New Mexico State University

Predicting Grades in Chemistry 101

Gordon J. Ewing, Chemistry Department
New Mexico State University (1985)

Introduction

General Chemistry has a reputation at most Universities that places it among the more difficult courses at the freshman level. New Mexico State University is no exception. Over several years the number of unsatisfactory grades (Ds, Fs & Ws) have remained nearly constant at about 40% in Chemistry 101. The study was conducted with the hope that it would help advisors and students to decide whether or not to select Chemistry 101 at registration.

The current Bulletin (June 1985) lists any of the following as a prerequisite for Chemistry 101:

1. A "B" or better obtained in high school Chemistry.
2. Credit obtained in Chemistry 100.
3. Eligible to take Math 115.

While these prerequisites seem reasonable some other possible prerequisites are suggested in this paper.

Procedure

The high school GPA's and the ACT scores were obtained for all the students who took Chemistry 101 during the fall semester in 1982. Not all records were complete but records in each area were obtained on over 600 students. These numbers were correlated with the grades earned by the students in Chemistry 101.

For each ACT score and for each interval of 0.1 in the high school GPA, a "Chemistry GPA" was determined. These "Chemistry GPA's" were plotted vs the appropriate ACT scores or high school GPA's. The plots are attached. The Chemistry GPA is called the Average Chem 101 Grade.

Discussion

High School GPAs. As can be seen in Fig. 1, a plot of high school GPA vs average Chemistry grade is not linear. Up to a GPA of nearly 3.5 the slope is relatively low while above 3.5 the line is much steeper. This seems to agree with Ozsogomonyan and Loftus [J.Chem. Educ. 56, 173 (1979)] who compared high school Chemistry grades at Berkeley with the grades obtained in college Chemistry. They found that a "C" in high school chemistry meant nothing. Students with no high school chemistry did as well in general chemistry as those who made a "C". A "B" in high school chemistry was a slightly positive indicator of success in College chemistry while an "A" was a good indicator of success (only 2% got D's or F's in college chemistry).

Figure 1 indicates that NMSU students are likely to have trouble with college chemistry if their high school GPA was lower than 3.3. One wonders about high school grade inflation if a high school GPA of 3.3 corresponds to a college chemistry grade of 1.5.

Social Science ACT Scores. If one takes the slope of a plot of ACT scores vs. average Chemistry 101 grade (GPA) as an indication of the value of the test score for Chem 101 grade predictions, then the Social Science ACT Score is the least valuable of the ACT scores for predicting general chemistry performance (see Fig. 2). The plot, however, was quite linear and the linear regression line indicates that a score of 16 corresponds to a college chemistry GPA of 1.5. The average chemistry GPA of 1.5 was selected because it is roughly the point where a student has a 50% chance to pass Chem 101. The results are summarized in Table 1.

Natural Science ACT Scores. As can be seen in Fig 3, the Natural Science ACT Score is somewhat better at predicting Chemistry 101 performance than is the Social Science Score. A Natural Science ACT Score of 21 corresponds with a general chemistry GPA of 1.5.

Mathmatics ACT Scores. Most chemists would not be surprised to find a strong correlation between the Mathmatics ACT Score and success in Chemistry 101. Remedial Chemistry texts spend more time on problem solving than any other topic. Several studies have reported using SAT math scores as a means of predicting general chemistry performance. Pickering [J. Chem. Educ. 54, 433 (1977)] says that students with Math SAT Scores below 630 are high risk chemistry students and he has used 610 as a cut-off score for admission to general chemistry. Ozsogomonyan and Loftus [J. Chem. Educ. 56, 173 (1979)] stated that SAT Math Scores needed to be above 550 so that students would have a better chance for an "A" or a "B" than for a "D" or an "F" at Berkeley.

Fig. 1

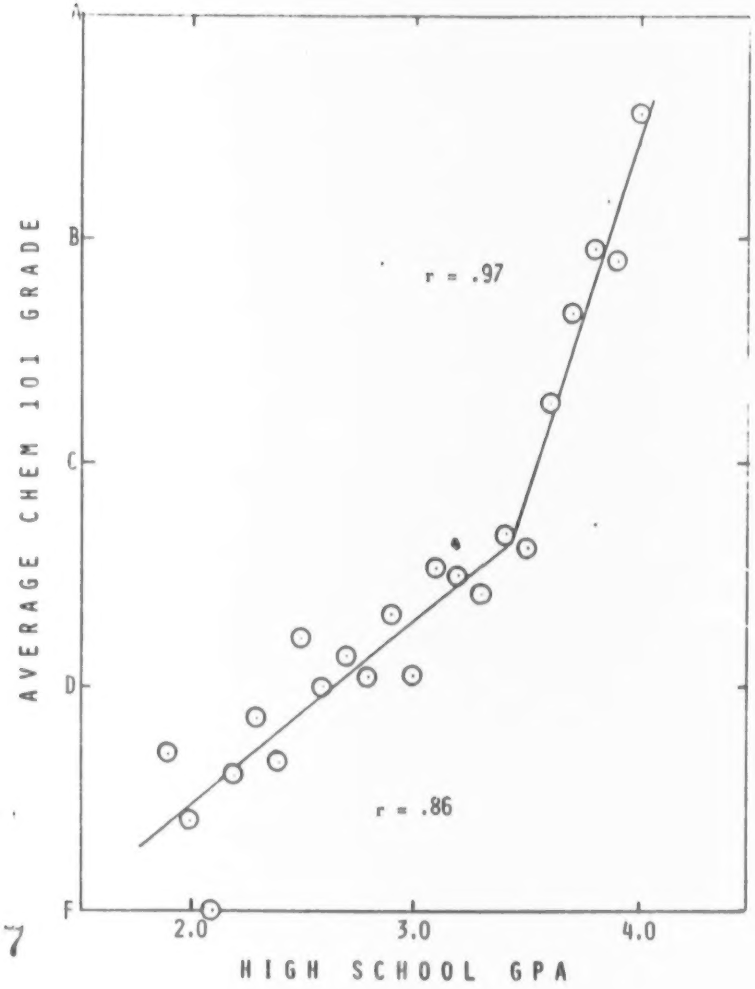
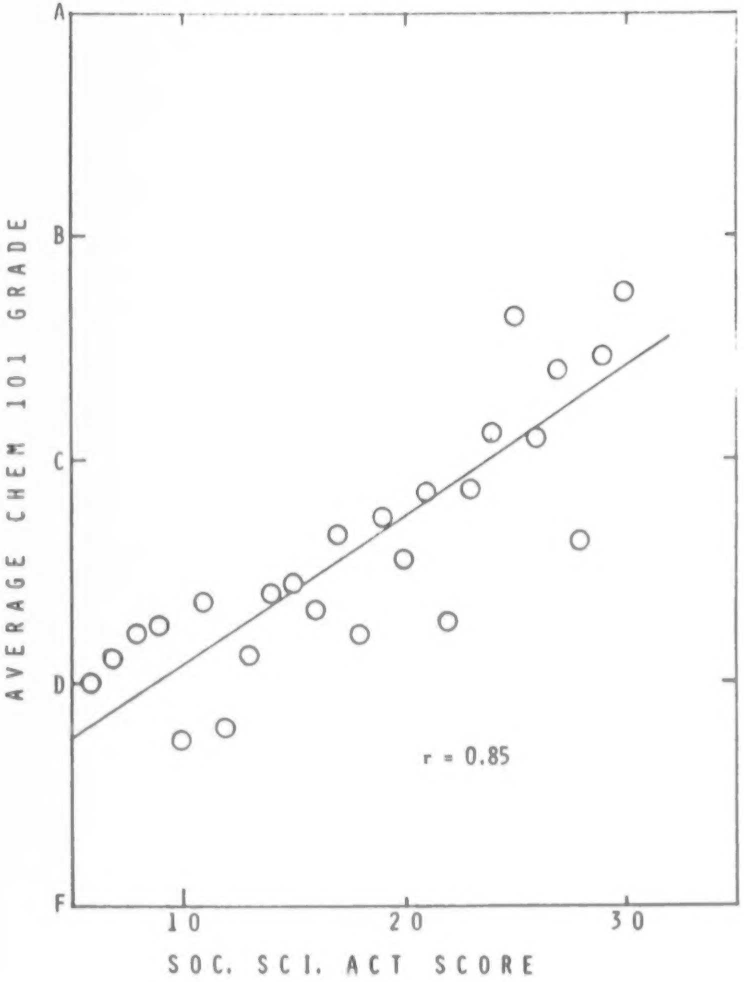

AVERAGE CHEM 101 GRADE
A
B
C
D
F
r = .97
r = .86
2.0
3.0
4.0
HIGH SCHOOL GPA

Fig. 2


AVERAGE CHEM 101 GRADE
A
B
C
D
F
r = 0.85
10
20
30
SOC. SCI. ACT SCORE

Finally Andrews & Andrews [J. Chem. Educ. 56, 231 (1979)] stated that students with Math SAT Scores below 600 did very poorly in general chemistry. No studies were found in the literature where chemistry grades were correlated with ACT Mathmatics scores.

In this study the Math ACT Score was a good indicator of Chemistry 101 success as is illustrated in Fig. 4. A Math ACT Score of 18 corresponded to reach a GPA of 1.5 for general chemistry.

English ACT Scores. It is interesting to note that the English ACT Score is possibly a little better for predicting Chemistry 101 grades than was the Math score. This clear importance of abilities in English in the success of Chemistry 101 students has led me to include a reading assignment with a written book report in the requirements for our remedial course, Chem 100.

Composite ACT Scores. The composite ACT Score was very much like the Math and English ACT scores in indicating how a student will do in Chemistry 101. It appears to be slightly better than either the math or the ENglish scores both in slope (Fig. 6) and in correlation coefficient. The ACT score that corresponds with a 1.5 GPA in general chemistry is 19 which agrees with Shearer and Nicholson (190th ACS Meeting, Chicago, Ill. 1985) who found that an ACT composite score of 18 was necessary for students to expect a C or better in general chemistry at Fort Hays State University. This is nearly the same as the 19 reported here. Shearer & Nicholson reported that the Composite ACT Score correlates better with Chemistry grades than the Math ACT and they also report that the Iowa Placement Exam is even better at predicting general chemistry performance.

Fig. 3

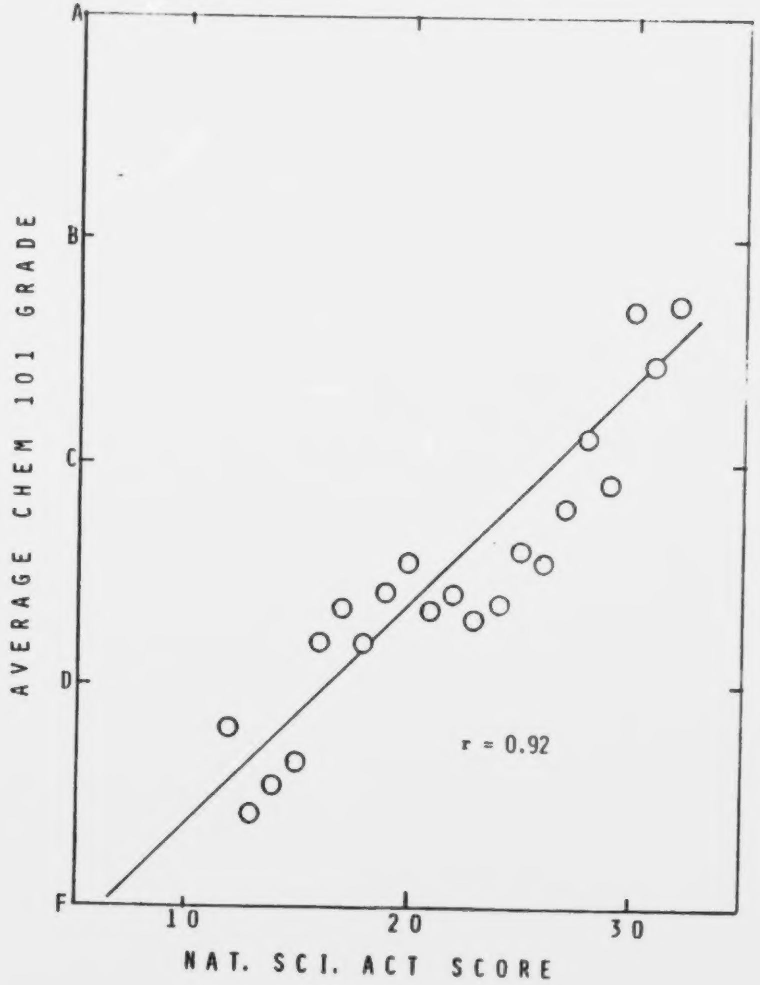

A
B
C
D
F
AVERAGE CHEM 101 GRADE
10
20
30
NAT. SCI. ACT SCORE
r = 0.92

Fig. 4

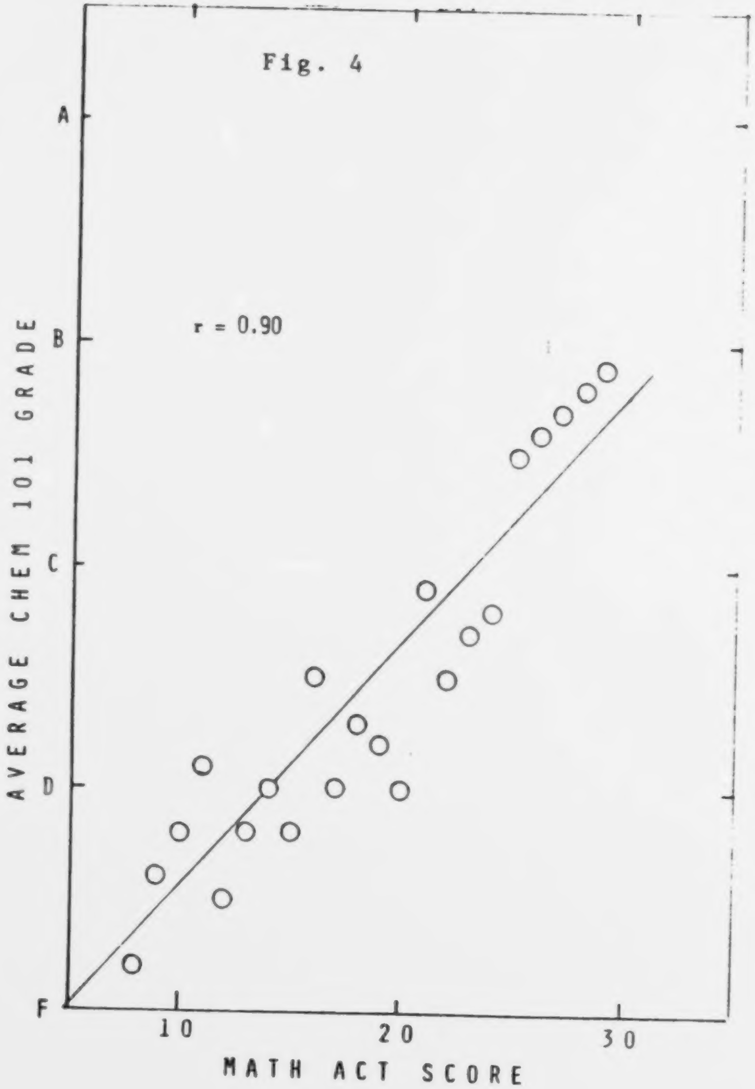

A
B
C
D
F
AVERAGE CHEM 101 GRADE
r = 0.90
10
20
30
MATH ACT SCORE

Fig. 5

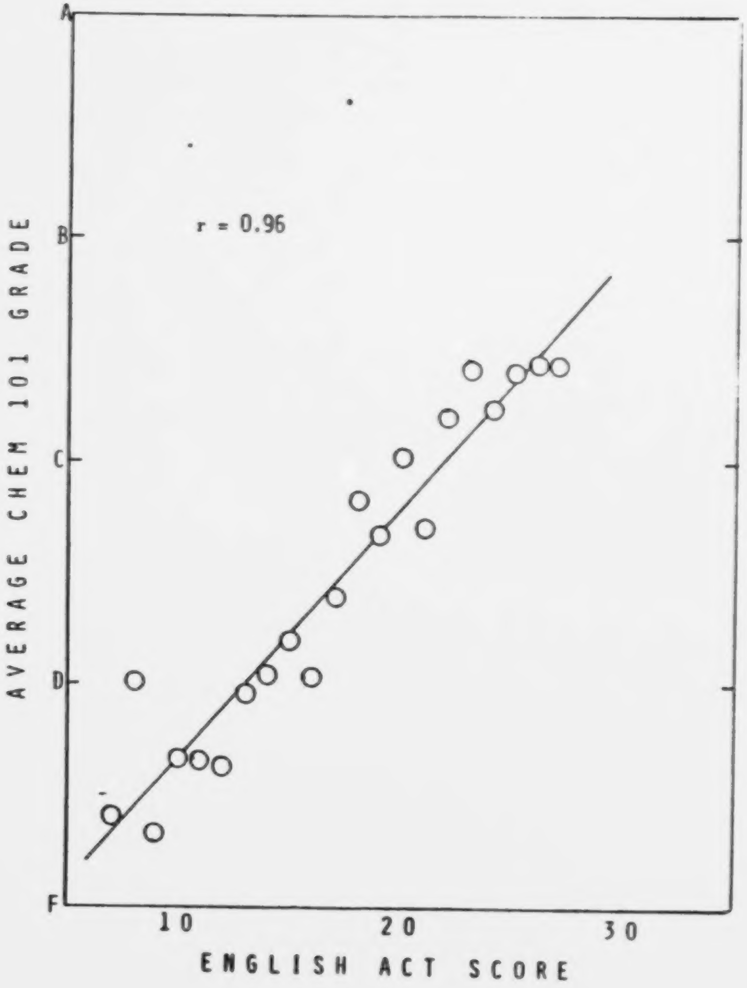
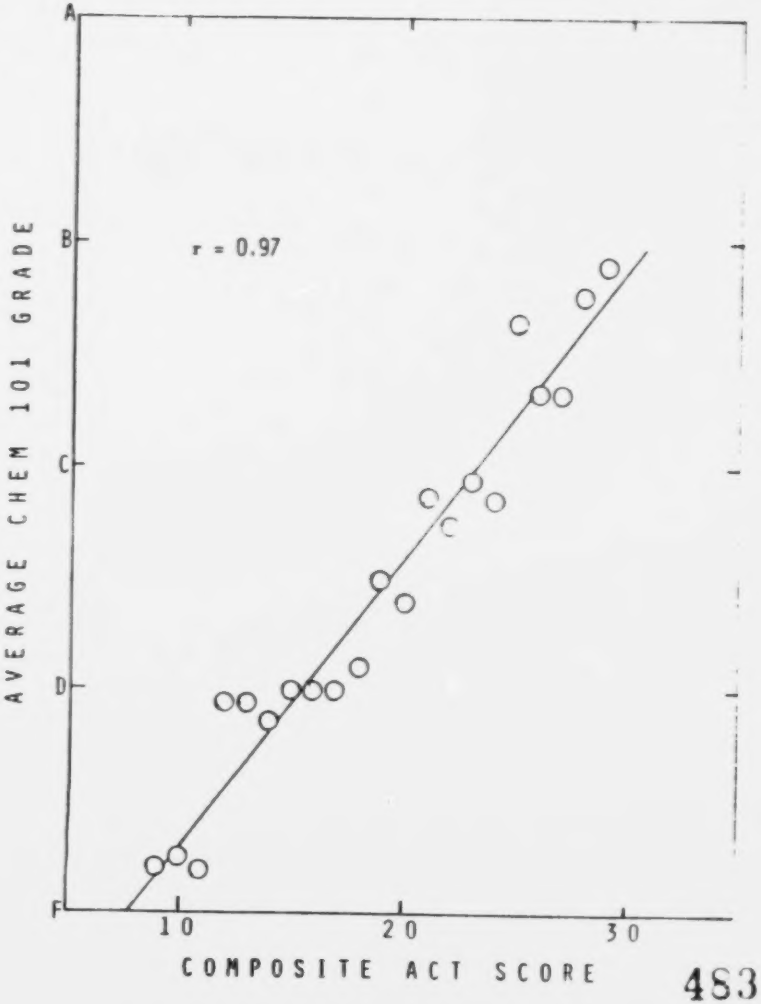

A
B
C
D
F
r = 0.96
AVERAGE CHEM 101 GRADE
10
20
30
ENGLISH ACT SCORE

Fig. 6


A
B
C
D
F
r = 0.97
AVERAGE CHEM 101 GRADE
10
20
30
COMPOSITE ACT SCORE

SUMMARY AND CONCLUSIONS

TABLE 1

ACT Scores vs. Chem 101 Grades

	Score Predicting a Chem GPA of 1.5	Slope GPA/ACT	Correlation Coefficient
Social Science	16	.065	0.85
Natural Science	21	.094	0.92
Mathmatics	18	.107	0.90
English	17	.113	0.96
Composite	19	.129	0.97

Students who have a high school GPA below 3.3 or a composite ACT score below 19 have less than a 50% chance of obtaining a grade of C or better in Chemistry 101. Such students should probably take one or more of the following classes prior to taking Chem 101:

English 101N
Math 102
Chem 100

TEACHING A FAULKNER NOVEL USING RESEARCH FROM THE DISCIPLINE OF ENGLISH

by

Daniel G. Ford

Southern Arkansas University

TEACHING A FAULKNER NOVEL USING RESEARCH FROM THE DISCIPLINE OF ENGLISH

Daniel G. Ford

We cannot train students to perceive the deep and complicated richness of literary art. We cannot rely on language for the qualities we seek to convey are often ineffable. We cannot rely on requiring memorization, stacking up facts, learning the lecture notes. We can educate them, though, so that they take intuitive leaps when the interpretation of literary art requires them to align their deepest sensibilities with the "hints" of the writer.

I have loved Keats's "Ode on a Grecian Urn" for a long time and I love to teach the poem: it gives me the opportunity to present that profound quintessence of art--the permanence of truth and beauty--in a simple, straightforward way. William Faulkner loved Keats's Ode, too, and he often commented on its worth. So, I was excited when I began to notice Urn-like imagery in one of Faulkner's finest works, an experimental novel entitled Go Down, Moses.

As I attempted to express this excitment to my students, I found that I needed further study, a more coherent argument, to get them to share my incoherent delight. So, I went to the main source in the field of literary scholarship, the MLA International Bibliography, and found that a few of my colleagues in the field had commented in print upon the influence of Keats's poem on Faulkner. Some of them had written specifically about Go Down, Moses.

Their comments helped me focus on one idea in the Ode which intrigued Faulkner the most--that lover who can never kiss his beloved, "though winning near the goal." The idea serves as a stabilizer for the diverse elements in Go Down, Moses. The novelist was clearly interested in unfulfilled pursuit.

In discussing his early hunting experiences, Faulkner said, "the pursuit is the thing, not the reward, not the gain" (Gwynn and Blotner 272). That idea led the author to experiment with imagery of stasis throughout his career. The familiar Faulknerian technique of freezing time so that moments of unfulfilled pursuit may be examined is certainly manifest in Go Down, Moses. The technique and the static imagery it calls forth help shape the seven stories into an artistic unit which Faulkner called a novel rather than a collection. Michael Millgate rightly terms Go Down, Moses Faulkner's culminating work, arguing that it contains practically all of the major themes and techniques of the entire corpus (214).

Commentary has been concerned mainly with Isaac McCaslin's developing character first as a boy in the wilderness, then as a young man in the commissary, and finally as an old man in "Delta Autumn." The best story in the work, "The Bear," has naturally received greatest attention, but it has been viewed in most college classrooms as an autonomous story, not as a part of a novel. All of the stories are related to each other by static, Urn-like imagery, by similar descriptions done in terms of statuary and relief, by frozen moments and illusions of timelessness Faulkner produces through any number of means in depicting the mad pursuits of his characters.

The center of the motif of static pursuit comes in part 4 of "The Bear" with the actual quotation of Keats's "Ode on a Grecian Urn." Expressions of "Forever wilt thou love and she be fair" resound lyrically in all the stories, reflecting the structure of the work as a whole, and the artistic, though sadly unrealistic, idea of Isaac McCaslin regarding his inheritance.

Quite early, Olga Vickery noted the structural function of pursuit by commenting upon the many levels of the hunt motif as they buttress the theme of black-white relationships (124-125). But the hunt, the idea of pursuit for its own sake, functions in other and more subtle ways as well. Faulkner himself claimed that pursuit is better than fulfillment and Blanche H. Gelfant has observed most articulately that Ike "saw in the Urn's romantic pursuit, the lover chasing but never reaching the girl, a moral paradigm for the hunt that led him to pursue, though never to kill, the bear. In both actions, moral value lay in the chase itself rather than in the attainment of its object. Both pursuits must continue but never lead to consummation, for fulfillment is the very condition for perpetuation of the ideal--of love in the Ode, and virtue and courage in 'The Bear'" (63). Such paradoxical pursuits in Go Down, Moses, mad as they sometimes seem, warrant a close study for presentation to literature students in terms of theme, structure, and the artist's temporal vision.

Weldon Thornton's excellent article helped me relate the structure of the first story "Was" to that of the larger work. He shows the theme of pursuit at work in even the slightest details (85). And, I understood the second story, "The Fire and the Hearth," in terms of imagery and the poetry of stasis thanks to commentators as diverse as William B. Stone (93-94) and Cleanth Brooks (19).

Even though the next story, "Pantaloon in Black," is not as neatly related to the other parts of Go Down, Moses as one might wish, there are thematic interrelationships of both objects and events (Thornton 75). Faulkner was right to include it as part of the novel, for, as John L. Clemen points out, its main idea, Rider's humanity, is in keeping with the overall design of the book--namely, to show the humanity of black people (170-181).

Although "The Old People" is a fascinating and moving tale in its own right, it seems to be prologue to "The Bear" and, therefore, part of it. It introduces Isaac McCaslin, the boy, in confused pursuit of deer and worthiness and understanding and immortality. It also introduces Sam Fathers, whose pursuit is for solitude and death.

There are several references to time in the story, some of them forced, such as the moment Ike tries to "decelerate the dizzy rushing of time in which the buck...was moving" (180), the prosey moment when Ike becomes a true hunter, "that morning something had happened to him: in less than a second he had ceased forever to be the child he was yesterday" (181), and the abstract, non-poetic expression of the eternal now in Isaac's consciousness, "gradually to the boy those old times would cease to be old times and would become a part of the boy's present, not only as if they had happened yesterday but as if they were still happening...And more: as if some of them had not happened yet but would occur tomorrow, until at last it would seem...that he himself had not come into existence yet" (171). But the best and most poetic expression of pursuit in stasis so philosophically described in those passages, is in the only Urn-like frozen moment in "The Old People":

> The buck still and forever leaped, the shaking gunbarrels coming constantly and forever steady at last, crashing, and still out of his instant of immortality the buck sprang, forever immortal. (178)

This "poem," which could be entitled "The Buck Forever," both culminates the frozen moments of the collection to that point and, because it is the first absolutely arrested image of pursuit, looks forward to those moments to come. It especially foreshadows old Isaac's heavenly dream of the buck still and forever leaping as he dozes, corpse-like, on his narrow cot in "Delta Autumn." By arresting the moment of the deer's death into Urn-like relief, Faulkner gives the animal the absolute immortality of the figures on Keats's Urn. The buck will always be fair and Isaac will never have to grieve. With this splendid image, Faulkner sets the timeless and immortal stage for his masterpiece, "The Bear." Since this is the story most English teachers concentrate upon, let me tell you exactly what I tell my students about it.

I show them how Faulkner's familiar imagery of stasis takes on a richness in "The Bear," a resonance inspired and informed by the idea of pleasure implicit in capturing intact, and yet not destroying. Faulkner imitates the static pursuit of the lover on Keats's Urn in explaining Isaac's attitude toward the buck and Old Ben. Also, the Platonic idea of Truth associated with the Urn is a significant factor in Ike's relinquishment of his inheritance.

When the hunting party goes into Big Bottom each year, "they were going not to hunt bear and deer but to keep yearly rendezvous with the bear which they did not even intend to kill" (194). Major de Spain comments upon the value of pursuit after having wounded and lost Old Ben: "Never mind....It was a damned fine race. And we drew blood" (226). Old Ben himself participated in his own annual mad pursuit to assure his fierce liberty by jeopardizing it. The bear is like the figures on the Urn, out of an old dead time, but still most truly and beautifully living, "not even a mortal beast but an anachronism indomitable and invincible out of an old dead time, a phantom, epitome and apotheosis of the old wild life" (193).

I try to show students that Faulkner creates two worlds in the "Bear," that of the old wild life representing truth and that of the modern South, representing change. The irony is, of course, that the old wild life, symbolized by Old Ben, Sam Fathers, the wilderness, and, perhaps to some degree by Boon Hoggenbeck, changes too in order to accommodate the modern

South. That irony is captured most succinctly in the episode of the snake in part 5.

Here, Ike is a teenager, having been initiated into worthiness and still not mindful of the taint in his inheritance. Even though Faulkner presents him as a kind of poet, mature enough to acknowledge the necessity for grief and wise enough to understand that glory exists because of the transient nature of life, he nevertheless insists upon absolute unchanging nature represented by the wilderness. So the irony is intense when Faulkner makes us feel, despite Ike's lyrical convictions, that Sam Fathers may be as much the snake in Eden as old Carothers is. After all, Sam's wisdom proves useless to Ike in living through times of rapid change (Thornton 100). The snake seemed to be

> an entity walking on two feet and free of all laws of mass and balance and should have been because even now he could not quite believe that...walking head could have been one snake...standing with one hand raised as Sam had stood that afternoon six years ago when Sam led him into the wilderness and showed him and he ceased to be a child, speaking the old tongue which Sam had spoken that day without premeditation either: "Chief," he said: "Grandfather." (329-330)

Even though here and elsewhere in "The Bear" Faulkner attempts to merge and blend reality and perfection (Gelfant 47), there is a sense most often of two worlds, the absolute one epitomized by the Urn, and the tainted and mutable one. The artist expresses the dichotomy both temporally and spatially. There is a permeating sense, for example, of a pure and absolute timelessness out of which human time flows. "It seemed to him that he could see them, the two of them, shadowy in the limbo from which time emerged and became time" (204). Similarly, there is a sense of absolute immobility from which flows motion. The bear "did not emerge, appear: it was just there, immobile, fixed in the green and windless noon's hot dappling" (209).

In regard to the idea of arrested time and motion, Faulkner said in an "interview" in Paris Review (which Malcolm Cowley believes Faulkner composed rather than performed for his friend Jean Stein) that the artist should arrest motion in order to preserve it to move again in the future. Keats's Ode was important to Faulkner because it is an example of life arrested for future contemplation. It is his model for much of the imagery in "The Bear" (Cavanaugh 2783A-84A).

The climax of "The Bear" is the actual killing or sacrifice of Old Ben at the green altar to which Sam has led the party. All the nearby towns are emptied of their folk this pious morn. But only a few are privileged to witness the frozen moment, the statue, of the sacrifice (Sams 634):

> For an instant they almost resembled a piece of statuary: the clinging dog, the bear, the man astride its back...It didn't collapse, crumple. It fell all of a piece. (241)

In the rich stream of consciousness narration in part 4, the memory of McCaslin Edmond's actual reading of the Ode resounds as a stabilizer for the myriad associations called forth by the ledgers. Isaac delves into the world of tainted inheritance from multiple perspectives: historical, Biblical, poetic, and classical.

When Isaac and his cousin remember the Ode and McCaslin's interpretation of it--"[Keats] was talking about truth. Truth is one. It doesn't change. It covers all things which touch the heart"(297)--Ike hopes to perceive the ledgers as harmlessly and beautifully absolute. "What the old books contained would be after all these years fixed immutable, finished, unalterable, harmless"(268). But the ledgers cannot be perceived as truth and beauty, even though they are perfect as frozen symbols for the South, "that chronicle which was a whole land in minature, which multiplied and compounded was the entire South" (293).

At a crucial point in part 4, Isaac realizes that the ledgers, far from being beautiful and harmless, may be seen as God's record of evil, open--

> before the Throne Itself for a last perusal and contemplation and refreshment of the Allknowledgable before the yellowed pages and the brown thin ink in which was recorded the injustice and a little at least of its amelioration and restitution faded back forever into the anonymous communal original dust. (261)

That brilliant description of the ledgers freezes them into symbolic configrations antithetical to the Urn. They are symbols of that other world of change and dust and decay and eternal nothingness. Faulkner sees in everything its own opposite. The ledgers signify corruption in the same manner in which the Urn signifies spiritual purity (Gelfant 46-47, 55).

But, as I have pointed out, Faulkner sandwiches between the disillusioned Isaac of the commissary in part 4 and sadder but wiser Isaac of "Delta Autumn" the lush Eden of the teenaged Ike in part 5 where Faulkner returns to the imagery of stasis related to Keats's ode. Ike insists upon the eternality of the wilderness and denies the possibility of death.

Acknowledging that no single character speaks for Faulkner (Millgate 207), least of all, perhaps, Isaac McCaslin, I conclude my discussion of "The Bear" speculatively. It is in this Eden of part 5 that we find Boon at the gum tree. Critics have written a great deal about the scene but perhaps not enough about Boon. "[T]ime [was] merely something [Boon] walked through as he did through air, aging him no more than air did" (228). Even though there is a serpent in Eden, there is also a Tree of the Knowledge of Good and Evil and at least one unfallen Adam who will not eat of it fruit. Two if you count Isaac.

The theme of mad pursuit is softened considerably in "Delta Autumn." I won't give a thorough commentary on that story, though I would like to point out that Isaac McCaslin in his seventies is quite a different character from the idealist poet of "The Bear." He declares in the very first paragraph of the story that even the sea will dissolve away. But that does not keep him from seeking the glory of the wilderness and of his past. Still, it is significant that Faulkner's description of his remembrance is in sequential, clock-calendar time rather than in aspects of the absolute or durational eternality.

Yet in Isaac's dream near the end of the story, he seems to be in heaven. The Urn's eternal joy of pursuit remains intact and unalterable in Isaac's heart where there is--

> a dimension free of both time and space [where he moved] again among the shades of tall unaxed trees and sightless brakes where the wild strong immortal game ran forever before the tireless belling immortal hounds, falling and rising phoenix-like to the sounding guns. (354)

Moses went down and freed the children of Israel from one kind of slavery to the long enslavement of pursuit for the promised land which he, himself, could not enter. Like the figures on Keats's urn, Isaac McCaslin both does and does not enter the promised land there on his narrow cot, arms folded.

The major mad pursuit of the final story, "Go Down, Moses," is Gavin Steven's quest to do right in his community. This story is made of the same dust as "Pantaloon in Black." As he does in that story, Faulkner makes some effort to arrest motion in the imagery of statuary. But immediately following the image, he affirms the transience of man's life by showing its ultimate end. Directly after this description, Samuel Worsham is executed:

> The negroid hair had been treated so that it covered the skull like a cap, in a single neat-ridged sweep, with the appearance of having been lacquered, the part trimmed out with a razor, so that the head resembled a bronze head, imperishable and enduring. (369)

Regardless, that head, and the rest of the corpse was in the casket which the Jefferson Negro undertakers met at the train. They "carried it to the hearse and snatched the wreaths and floral symbols of man's ultimate and inevitable end briskly out and slid the casket in and flung the flowers back and clapped-to the door" (382).

The final comment on pursuit in the novel sums up the idea of decorum implicit in pursuit in all the stories. What is pursued does not matter; whether or not it is caught is of little consequence. What is important is that the pursuit is carried on properly. The pursuits of all the stories resound in this statement from Gavin Stevens:

> It doesn't matter to her now. Since it had to be and she couldn't stop it, and now that it's all over and done and finished, she doesn't care how he died. She just wanted him home, but she wanted him to come home right. She wanted that casket and those flowers and the hearse and she wanted to ride through town behind it in a car. (383)

The decorum of pursuit plays a large role in much of the world's literature; so it is not remarkable that the idea is thematic in Go Down, Moses. But in that work, mad pursuit presented through imagery of stasis, goes beyond thematic to structural. The seven stories are related to each other more by Urn-like imagery than by anything else. This amalgam of imagery, theme, and structure results from a deep and complicated quality in William Faulkner's vision of time and in his idea of artist's function, a quality I hope my students are glimpsing, thanks to the stimulation of my publishing colleagues in the discipline of English. For a more thorough treatment of the ideas in this paper, I recommend my essay in Volume VIII, Number 2 of College Literature (Spring, 1981).

List of Works Cited

Brooks, Cleanth. "Faulkner as Poet." Southern Literary Journal 1.1 (1968): 5-19.

Cavanaugh, Hilayne E. "Fualkner, Stasis, and Keats's 'Ode on a Grecian Urn.'" DAI 38 (1977): 2783A-84A.

Clemen, John L. "'Pantaloon in Black': Its Place in Go Down, Moses." Tennessee Studies in Literature 22 (1977): 170-81.

Faulkner, William. Go Down, Moses. New York: Random House, 1942.

Ford, Daniel G. "Mad Pursuit in Go Down, Moses." College Literature 8.2 (1981): 115-126.

Gelfant, Blanche H. "Faulkner and Keats: The Ideality of Art in 'The Bear.'" Southern Literary Journal 2.1 (1969): 43-65.

Gwynn, Frederick L. and Joseph L. Blotner, Eds. Faulkner in the University. Charlottesville: Univ. of Virginia Press, 1959.

Millgate, Michael. The Achievement of William Faulkner. New York: Random House, 1966.

Thornton, Weldon. "Structure and Theme in Faulkner's Go Down, Moses." Costerus 3 (1975): 73-112.

Stone, William B. "Ike McCaslin and the Grecian Urn." Studies in Short Fiction 10 (1973): 93-94.

Vickery, Olga. The Novels of William Faulkner: A Critical Interpretation. Baton Rouge: Louisiana State Univ. Press, 1959.

VISUALLY AND VERBALLY INITIATED MENTAL IMAGERY AND SUCCESS IN LANDSCAPE ARCHITECTURAL EDUCATION

by

Edwin R. Hoag, ASLA

Texas A & M University

Introduction

Visual thinking is involved in most human activity, either in an abstract and theoretical or an applied mode (McKim, 1980). Spatial visualization is the ability to mentally manipulate, rotate, twist or invert pictorially presented visual stimuli. Mental visualization is the ability to create imagery in the mind from a verbal or visual prompt. In the academic setting, the student is assigned a project and the design education cycle is begun. In what is basically a tutorial situation, faculty members circulate among the students to answer questions and provide critiques. In order for this teaching technique to work, the students must be able to visualize design elements and/or proposals in their minds, transfer them to paper of a 3-dimensional model, and be able to verbalize to an instructor what these drawings or models mean. Likewise, the student must be able to take verbal comments and critiques from the instructor and visualize them in the mind in order to understand fully the instructor's comments and suggestions. The often-heard response from students "I don't see what you're saying" may in reality be a statement of fact. If a student enters a program with deficiencies in verbalization, math or science, he or she must take remedial courses before being allowed to continue. Why aren't students with low-level visualization skills identified and cycled through remedial coursework to prepare them for the design curriculua. If this were done, students could enter a design curriculum with a balance of verbal, graphic and mental imagery skills.

Past Studies

Approximately one-sixth of a normal population are capable of vivid mental imagery. Another one-sixth do not, or cannot use their visual thinking capabilities. The remaining two thirds of the population can evoke visual patterns when necessary (Bagnel and Koeberg, 1976). In pre-World War I Britian, spatial skills tests were used to separate successful students from those who were considered unlikely to succeed in ordinary school (Smith, 1925). The practice of testing recruits to determine their most efficient role is a routine procedure in most armed forces today (Smith, 1964). Positive relationships between spatial test performance and success in engineering education have also been confirmed (Blades and Watson, 1954).

First year architectural students who exhibited the ability to think visually or spatially fared better than those students who exhibited non-visual thinking (Peterson and Lasky, 1978). Grades on independent laboratory assignments and scores on a cubes comparison test have produced high correlation coefficients when compared to faculty ratings or creativity in fourth-year architecture students (Karlins, Schuerhoff and Kaplan, 1969).

Spatial ability has been shown to be trainable in both female and male adults (Stricker and Levesconte, 1962). Similar results were reported by Mark McGee (1978) in his study of sex differences in mental rotation tests. Dr. David Ben-Heim (1982) confirmed that spatial ability not only increased with age and training but that these skills were retained and continued to develop after training. Research indicates that spatial skills, and mental visualzation skills in particular, can be improved through instruction as well as application and experience. There is also evidence that there is a correlation between the ability to create mental imagery, visual thinking and creativity and success in architecture. Why is this so? How does the abilty to think visually and generate mental imagery contribute to one's creativity, attitude and motivation? A possible explanation may be that mental visualization is the means by which verbal information is processed into a format that can be more readily applied to the task at hand, thus completing a design education cycle of verbalization, visualization and documentation (drawings or three dimensional models).

Methods

The primary objective of this study is to verify that a relationship does exist between the ability to create and manipulate verbally and visually initiated mental imagery and academic success in Landscape Architecture. In order to explore the role of verbally and visuallay-initiated mental imagery in landscape architectural education, the following null hypotheses were proposed:

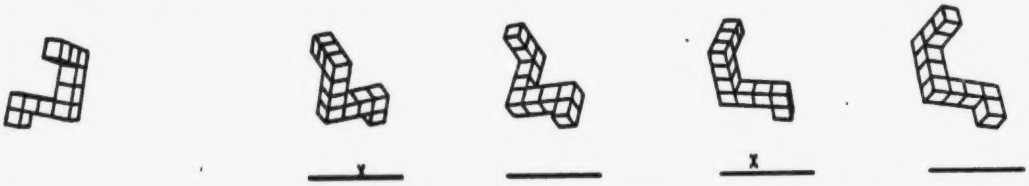
Null Hypothesis 1. There are no positive correlations between an individual's mental visualization ability and the ability to create mental imagery from verbal cues or stimuli.

Null Hypothesis 2. There are no positive correlations between an individual's mental visualization ability, the ability to create mental inagery from verbal and/or visual prompts and academic success in Landscape Design, Landscape Construction, Landscape Graphics, Plane Surveying and Plane Trigonometry.

Null Hypothesis 3. There are no positive correlations between an individual's mental visualization ability, the ability to create mental imagery from verbal and/or visual prompts and SAT verbal and SAT Math test scores.

In order to generate the data required to test these hypotheses, the following were proposed:

A. To test all sophomore, junior and senior students in the Department of Landscape Architecture at Texas A&M University to determine student mental visualization abilites. This would be done by means of the Shepard and Metzler cubes rotation test, hereafter refered to as the CUBES test, administered in the fall of 1984. A sample test problem is presented below.



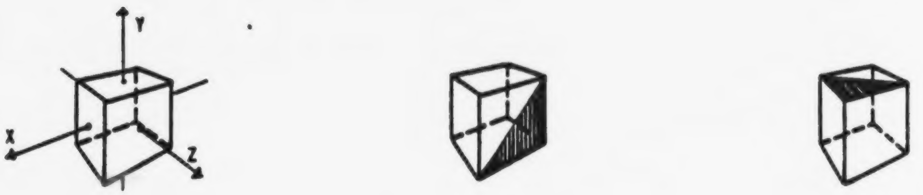
Stimulus Indicate with a check mark which two of these four objects is the same object.

Figure 1, Example of CUBES test.

B. To test all sophomore, junior and senior students in the Department of Landscape Architecture at Texas A&M University to determine student abilities to create and manipulate mental images from a verbal prompt, as opposed to a visual prompt or stimulus as is the case with the CUBES test. This would be accomplished by means of a Verbally Initiated Cube Test (VICT). In this test, a student would begin with a cube ,with a diagonal line and a shaded portion on one side, and manipulate it mentally about x, y, and z, axis according to verbal instructions. The stubject would then mark a response cube in a manner that reflects the mental image resulting from following the verbal instructions. This simulates the interaction between a student and an instructor in the design studio situation during the course of a project.

A sample VICT problem is presented in Figure 2.

The results of the CUBES test and the VICT test would then be correlated with other study variables to determine the validity of the null hypotheses.



Axis Diagram

Starting Cube

Answer Cube

Sample Problem: Rotate the starting cube 90 degrees clockwise about the Y axis and 270 degrees counterclockwise about the Z axis. The correct solution to this problem is indicated on the Answer Cube.

Figure 2, A Sample VICT Exercise.

Data analysis.

The test population consisted of 127 sophomores, juniors and seniors within the Department of Landscape Architecture at Texas A&M University (60.58% of the total departmental undergraduate population). Sixty-five percent of the test population were male and thirty-five percent were female. Approximately one-third of the test population were sophomores, one-third were juniors and one-third were seniors.

Because of the subjectivity associated with the grading of design, graphic and construction coursework, the following criteria were developed to state the strength of relationships.

Table 1.

Strength of Relationships Criteria.

Strength of Relationship	"r" and "p" values
No Significant Relationship	"r" equal to or less than .30 and "p" greater than .10
Moderate Relationship	"r" greater than .30 and less than .70 with "p" less than .10
Strong Relationship	"r" equal to or greater than .70 with a "p" less than .10

The data from the CUBES test are summarized on Table 2. It is interesting to note the apparent decline in visual-to-visual ability reflected by the lower mean score for the Senior population. It must be remembered, however, that these data are based upon an individual sampling of a single student population and do not have the credibility of data taken over a long period of time note have these data been compated to statistics from another program in Landscape Architecture. Analysis of the data via Student-Newman-Keuls procedures (SAS 1982) revealed that no statistically significant differences occur between the three sub-populations. Further analysis of the data via the General linear Models Procedures (sas 1982) revealed no significant linear trend between the populations.

Table 2.

Summary of CUBES Test Results

Variable	Mean	St. Deviation	Variance	N
Total Test Population	83.33	18.34	336.44	103
Senior Population	80.75	22.24	4946.62	37
Junior Population	87.34	13.26	175.82	33
Sophomore Population	82.12	17.85	318.62	33

The results of the VICT test are summarized in Table 3. A comparison of the means via the Student-Newman-Keules procedure revealed no significant differences occurring between the three sub-populations. Similarly, analysis of the data by the General Linear Treands Models Procecure revealed no positive or negative trend in the mean test scores.

Table 3.

Summary of VICT Test Results

Variable	Mean	St. Deviation	Variance	N
Total Test Population	55.35	22.95	526.78	103
Senior Population	52.62	22.27	495.96	37
Junior Population	60.65	23.47	549.56	33
Sophomore Population	53.58	22.51	506.56	33

Testing of Null Hypothesis

The first null hypothesis stated that a zero relationship exists between the ability to create mental imagery from a visual prompt and the ability to create mental imagery from a verbal prompt. The validity of this null hypothesis was determined by correlating the score of the CUBES test (a measure of visual-to-visual ability) with the scores of the VICT test (a measure of verbal-to-visual ability). The correlations coefficient between these two variables revealed a moderate positive relationship (r=.41, p=.0001, n=103, refer to Table 1). Further analysis of the data revealed that the difference between an individual's CUBE test score and VICT test score (referred to as DIFF) had a strong negative correlation to the mean score of the two tests (r=-.53, p=.0001, n=103). This implies that those individuals who had similar performance levels on both tests had higher scores on both tests than those individuals who did well on one test and not as well on the other test. There are no students with poor test scores on both tests. This might suggest a high academic mortality among those students with neither an adequate visual-to-visual nor verbal-to-visual capacity. It is also interesting to note that only six of the 103 subjects (6%) scored higher on the VICT test than on the CUBES test. A strong negative correlation was observed between DIFF scores and performance on the VICT test (r=-.79, p=.0001, n=103) with no such relationship existing between the DIFF and the CUBES test scores (r=.002, p=.98, n=103). This implies that as an individual's verbal-to-visual ability approaches the level of the visual-to-visual ability, the overall effectiveness of both abilities increases. There is also an implication that visual-to-visual skills are a prerequisite to the development of verbal-to-visual-skills , although this cannot be proven from the data at hand. Based upon the data, the first null hypothsis is rejected and it is concluded that a moderate positive relationship exists between visual-to-visual ability and verbal-to-visual ability.

The second null hypothesis stated that no positive relationships exist between verbal-to-visual and visual-to-visual abilities and academic success in Landscape Architecture and related coursework (refer to Table 4.). Based upon these data, the second null hypothesis is partially rejected. Moderate relationships exist between academic performance, as reflected in grades, and visual-to-visual and verbal-to-visual skill levels in certain academic areas. This variation can be attributed to many causes, among them, course rigor, instructor expectations as expressed by grades, the degree to which a student needs these skills to solve problems presented in class and the ability of some student to cope with these perceived deficiences in some manner. It is therfore concluded that there are positive relationships between the results of the two tests and academic performance in math and upper level design and construction courses.

Table 4.

Summary of Variables and Test Correlation Coefficients.

Variable	CUBES Test	VICT Test
GPR	r=.016, p=.88, n=103	r=.004, p=.96, n=103
MATH 103	r=.25, p=.07, n=54	r=.04, p=.78, n=54
CE201	r=.09, p=.50, n=52	r=.17, p=.23, n=.54
LAND 220	r=.17, p=.16, n=69	r= -.01, p=.92, n=69
LAND 221	r= -.12, p=.31, n=69	r=.08, p=.48 n=69
LAND 231	r=.28, p=.02, n=68	r=.27, p-.03, n=68
LAND 250	r=.008, p=.94, n=66	r=.12, p=.36, n=66
LAND 320	r=.20, p=.24, n=37	r=.21, p=.21, n=37
LAND 321	r=.10, p=.54, n=37	r=.01, p=.95, n=37
LAND 330	r=.43, p=.008, n=36	r=.33, p=.05, n=36
LAND 331	r=.39, p=.02, n=36	r=.43, p=.008, n=36
LAND 420	r=.10, p=.66, n=24	r=.32, p=.13, n=24

GPR	Grade Point Ratio	MATH 103	Plane Trigonometry
CE 201	Plane Surveying	LAND 220	Landscape Design I
LAND 221	Landscape Design II	LAND 231	Landscape Construction I

LAND 221.......Landscape Design II
LAND 231......Landscape Construction I
LAND 250.......Landscape Architectural Graphics
LAND 320......Landscape Design III
LAND 321.......Landscape Design IV
LAND 330......Landscape Construction II
LAND 331.......Landscape Construction III
LAND 420......Landscape Design V

The third hypothesis stated that no positive relationships exist between SAT Math scores, SAT Verbal test scores and the results of the CUBES and VICT test scores. Partial rejection of this hypothesis is based upon the correlation coefficients relating test scores to the VICT test results. The VICT test scores and the SAT Verbal test scores had a positive correlation coefficient of r=.35, significant at a level of .04. Correlation coefficients for the VICT test scores and the SAT Math test scores were weaker (r=.25, p=.14). It is interesting to note that these correlation coefficients are stronger, in a relative sense, than those between the CUBES test scores and the SAT Verbal and SAT Math test scores (r=.05, p=.76, n=35 and r=.004, p=.98, n=35 respectively).

From these data, it is concluded that a moderate positive relationship exists between VICT test results and SAT Verbal test scores. Correlation coefficients between VICT test results and SAT Math test scores approached significance. Based upon the evidence presented, the third null hypothesis is partially rejected and it is concluded the moderate positive relationships exist between VICT test scores and SAT Verbal and SAT Math test scores.

Recommendations.

Based upon the information contained in this study, it is recommended that all students entering a program in Landscape Architecture receive training in visual-to-visual and verbal-to-visual imagery development. Students found to be delinquent after this training should be cycled through remedial courses to reinforce development of these skills prior to encountering upper-level design and construction coursework. Faculty should also be tested to determine their visual-to-visual and verbal-to-visual ability levels. The result might be that faculty members could be matched to courses based upon similarity between faculty visualization levels and student visualization levels. Also, a faculty member who is verbally oriented and must, out of necessity, teach a visually-oriented course, will be able to prepare accordingly (such as intensive use of slides, visiting lecturers, field trips, etc).

Curricula within Departments of Landscape Architecture should take into consideration the fact that students appear to enter their programs with better visual-to-visual skills than verbal-to-visual skills. Design curriculum, therefore, should begin with large scale, visually resolved assignments and progress to smaller, more intellectual projects that require more thought and problem solving strategy.

References

Bagnal, Jim and Koeberg, Dan, The Universal Travler, William Kauffman Inc., Los Altos California, 1976.

Ben-Haim, David, Spatial Visualization: Sex Differences, Grade Level Differences and the Effect of Instruction on Performance and Attitudes of Middle School Boys and Girls, Michigan State University, 1982

Blade, Mary F., and Watson, Walter S., Increases in Spatial Visualization Test Scores During Engineering Education, psychological mongraphs, general and applied, vol 69, no. 12, 1955, The American Psychological Association Inc, Washington D.C.

Clements, M.A. and Wattanawaha, Nongnuch, Qualitative Aspects of Sex-Related Differences on Pencil and Paper Spatial Questions, Grades 7-9, Journal of Educational Psychology, 1982 vol. 74, no. 6, 878-887.

Cronbach, L.J. , Gesler, G.C., Nada, H., and Rajaratnam, N., The Dependability of Behavioral Measurements: Theory of Generalizability for Scores and Profiles, New York; John Wiley and Sons, 1972.

Karlins, Marvin, Schuerhoff, Charles and Kaplan, Martin, Some Factore Related to Architectural Creativity in Graduating Architecture Students, The Journal of Psychology, 1969, 81, 203-215.

McFarlane, M., A Study of Practical Ability, British Journal of Psychological Monograph Supplement, 1925, 8 (1 Whole no.8).

McGee, Mark G., Effects of Training and Practice on Sex-Differences in Mental Rotation Tasks, The Journal of Psychology, 1978, 100, 87-90.

McGee, Mark G., Human Spatial Abilities, Praeger Publishing, New York, New York, 1979

McKim, Robert H., Visual Thinking, A Stragegy Manual for Problem Solving, Lifelong Learning Publications, Belmont, California, 1980.

Pallrand, George J. and Seever, Fred, Spatial Ability and Achievement in Introductory Physics, The Journal of Research in Science Teaching, Vol. 21, No.5, pp 507-516, 1984.

Peterson, John M. and Lasky, Leonard M., Success in Architecture, Handedness and/or Visual Thinking, Department of Architecture, University of Cincinnati, 1979.

Smith, I.M., Spatial Ability, It's Educational and Social Significance, London, University of London, 1964.

The SAS Institute, SAS User's Guide; Statistics, SAS Institute Inc., Cary, North Carolina, 1982.

Streicker, Ann, and Levesconte, Shirley, Effects of Brief Training on Sex-Related Differences in Visual-Spatial Skill, Journal of Personality and Social Psychology, 1982, vol.43, 1018-1029.

USING RESEARCH RESULTS IN THE UNIVERSITY CLASSROOM

by

Charles E. Lamb

The University of Texas at Austin

Introduction

Faculty members at major universities are oftened evaluated in three categories of achievement. They are: teaching, scholarship, and service. Although seen by many as seperate and distinct entities, these areas often and in fact should overlap a great deal. The purpose of this paper is to describe the potential overlap of teaching and scholarship (research) in the author's area of expertise (mathematics education).

As the subject for this analysis, consider the undergraduate elementary methods course in mathematics. The typical student is prospective elementary school teacher, usually with only a minimal background in mathematics. The purpose of the course is to provide the soon-to-be teacher with pedagogical tools to be used to teach mathematics to young children.

Many would say that this is a formidable task and surely should concentrate on the "nuts and bolts" of classroom practice. While this notion has some merit, it is also the case that educational or content research results have an important role to play in this class. In the paragraphs that follow, examples of how research results can find their way into the university methods class will be explored. The examples can be grouped according to category. The five categories under consideration are:

1) Mathematical research;
2) General educational research;
3) Mathematics education research literature;
4) Personal research of the instructor; and
5) Personal experiences of the instructor.

Mathematical Research

Because mathematics is the content topic, it is incumbent upon the university instructor to be aware of major new developments in the content field. The ability to cite recent developments in the field (such as the discovery of a new, very large prime number via computer technology or the solution of the famous Four-Color Problem (Appel and Haken, 1977)) helps to provide students with a better understanding of the dynamic nature of the content field in which they will be teaching. Teachers of content areas such as mathematics should be cognizant of the fact that new knowledge is being developed everyday.

General Educational Research

The world of educational research is a vast and complex one. However specialized one's interests are, there are constantly new results of a general nature which seems to speak to all those involved in the educational enterprise. Whether one looks at the cognitive psychology, of a Piaget (Flavell, 1963), Gagńe (1962) or an Ausubel (1961) to discuss human learning characteristics or the work of Dunkin and Biddle (1974) to investigate teaching behaviors, it is important to know about the process of education (Bruner, 1960). As well as human characterists and teaching, there are several other areas such as individualized instruction, information processing, and instructional technology. All these areas have something to offer for those who would work with prospective teachers.

Mathematics Education Research Literature

Each year there are numerous research conducted which deal with the many varied aspects of mathematics education. The university instructor would do well to keep abreast of these new findings as they relate to the elementary school mathematics classroom. For example, one might be interested in the impact of the use of hand-held calculators in the elementary school mathematics classroom (Roberts, 1980). Several sources are available to the interested educator for reviewing recent research developments (Suydam, 1985).

Personal Research Experience

As the author teaches preservice elementary mathematics teachers, he often uses research results gathered in his own work. For example, results regarding how children require mathematical concepts related to measurement, (Lamb, 1975). As a follow-up, the author also talks to students about conjectured research projects or small-scale projects they might do in their teaching situations (Lamb, 1980).

Personal Experiences

Since education involves working with human beings, it seems useful for the instructor to share experiences of less than an experimental nature. As a former teacher of mathematics, the author uses anecdotal examples from his work with learners of mathematics. These provide my students with a "real-world" look at the teaching of elementary school mathematics.

Conclusion

Although one could give several more examples for each category, it is hoped that the above discussion makes a clear point. Especially in education, it is crucial that students (prospective educators) be aware of the dynamic status of the field of education as well as the current status of their chosen content field (mathematics). As instructors of such young people, it behooves the college faculty member to drive home the point that the only constant in the field of education is change. Using current research results in our classes can help us to do just that!

References

1) Appel, K. and Haken, W. (1977). The solution of the Four-Color Map Problem. Scientific American, October 1977, 108-121.

2) Ausubel, D.P. (1961). In defense of verbal learning. Educational Theory, 11, 15-25.

3) Bruner, J.S. (1960) The process of education. Cambridge, Mass.: Harvard University Press.

4) Dunkin, M.J. & Biddle, B.J. (1974) The study of teaching. New York: Holt, Rinehart, and Winston, Inc.

5) Flavell, K. (1963). The developmental psychology of Jean Piaget. New York: Van Nostrand Reinhold Co.

6) Gagne, R.M. (1962). The acquisition of knowledge. Psychological Review, 69, 355-365.

7) Lamb, C.E. (1975) The effect of measurement on the child's transitive and substitutive reasoning in number and length contexts. Unpublished doctoral dissertation - The University of Georgia.

8) Lamb, C. E. (1980) Language, reading, and mathematics. Revue de Phonetique Appliquee, 55-56, 255-261.

9) Roberts, D.M. (1980). The impact of electronic calculators. Review of Educational Research, 50, 71-98.

10) Suydam, M.N. (1985). Research on mathematics education reported in 1984. Journal for Research in Mathematics Education, 16, 243-315.

AN ANALYSIS OF COGNITIVE SKILLS ADDRESSED IN A UNIVERSITY TEACHER EDUCATION PROGRAM

by

Cherie Lohr and Elene Demos

Texas Christian University

An Analysis of Cognitive Skills
Addressed in a University Teacher Education Program

The professional educator utilizes information from a variety of sources to make numerous conscious/unconscious decisions about curriculum, instructional materials, activities, methodology, evaluation, and classroom management. This requires not only knowledge, skill, and experience, but also the ability to analyze, synthesize, and evaluate what has occurred in the classroom. Professional activity is thus characterized by the interaction of knowledge, synthesis, skill, reflection, and subsequent restructuring or adaptation of practice.

Those engaged in university teaching need to move future teachers beyond knowledge acquisition and provide them with situations that demand thought rather than blind acceptance, imagination and creativity rather than routinization and recall of information. Professional schools of education have a responsibility to discourage students from accepting existing classroom situations as given, essentially unalterable and beyond criticism. Students must encounter courses that encourage reflective thinking, critical analysis, and the careful selection of methods and materials, and appropriate evaluation procedures. (Turner, 1975; Belcher, 1975)

Teacher education programs, aspiring to produce capable professional educators, have struggled with the integration of both product and process skills in their undergraduate and graduate programs. The inclusion of skills from the knowledge to evaluation levels of Bloom's Taxonomy is critical to adequately preparing teachers, whether at the undergraduate or graduate levels. (Bloom, 1956).

The purpose of this inquiry was to examine the content of undergraduate and graduate courses in education to determine whether higher level objectives, activities/assignments, and evaluation criteria are evidenced in teacher preparation programs.

Teacher education programs do not merely transmit pedagogical content, they also model the appropriate processes necessary for ensuring that sound instructional decisions will eventually be integrated into elementary and secondary schools.

Using a stratified (graduate vs. undergraduate offering) random sampling of courses in our teacher education program, this study examined several variables to assess the degree to which high order cognitive thinking skills were employed. Data were collected from course syllabi and other supporting materials. The following components of each course were examined: levels of course objectives; levels of course acitivities; levels of course assignments.

Forty-one courses taught by 18 faculty members were examined for the initial component of the study. Offerings from elementary education (16), secondary education (3), special education (4), counseling (5), administration (8), and reading (5) were included in the sample. Eighteen of the courses were undergraduate level and 23 of the courses were graduate level offerings.

Fourteen of the courses were taught by eight males, and 27 of the courses were taught by ten females. Their ranks varied from assistant to full professors and their years of experience ranged from 0-3 years (3), 4-6 years (4), 7-10 years (6), 11 or more years (5).

In analyzing the data (refer to Table 1), it becomes apparent that there is a marked difference in the number and level of objectives in courses taught by faculty with less than three years of experience. It can be argued that the number of objectives is less significant than the level of objectives; however, to interpret the significance of the level, one must also address the number. Fully 85% of objectives listed by faculty members with three years or less experience were at the knowledge level of the cognitive domain (refer to Tables 2 and 3). Fifteen % were at the analysis level. Two levels of the cognitive domain are addressed in their course objectives (one faculty member in this group listed no objectives).

The data indicated that professors with four to six years of teaching experience listed 6% of their objectives at the lower levels of the cognitive domain (47% at the knowledge level, 21% at the comprehension level). The remainder of objectives, 32%, occurred at application through the evaluation levels.

Fifty-eight % of listed objectives were at the knowledge and comprehension levels for professors who have taught from 7-10 years. At the upper levels of the cognitive domain, 42% of objectives were listed.

Of the professors with 11 or more years of experience in this study, three did not identify objectives in their course syllabi. The remaining professors had 22% of their objectives at the lower levels and 78% at the upper levels.

When we examine the levels of assignments and activities listed for each course (refer to Tables 4, 5, and 6) a similar pattern emerges, with the exception of persons at the lower levels of experience. Professors with 0-3 years experience listed 17 assignments to attain their objectives; 47% of the assignments were at the knowledge and comprehension levels, while 53% were listed at the higher levels. This differs considerably from the levels of objectives listed in Tables 1 through 3.

Of the professors with 4-6 years of experience, 70% of their assignments were at the knowledge and comprehension levels, while 30% were at the higher levels and required application to evaluation activities.

Fifty-one % of the assignments for professors with 7-10 years of experience were at the knowledge and comprehension levels, while 49% of their assignments were listed at the higher levels.

Professors with 11 or more years of experience listed 70% of assignments at the knowledge and comprehension levels, while 30% of the assignments were at the higher levels and included assignments at the application through the evaluation levels.

Tables 7 and 8 present the data representing the number and percent of objectiyes by the undergraduate and graduate levels. At the undergraduate level, the largest number of objectives appeared at the knowledge level, while the evaluation level contained only one objective. Sixty-four % of objectives at the undergraduate level were reported at the knowledge and comprehension levels and 36% of the objectives were at the higher levels.

Graduate courses similarly presented objectives at all levels of the taxonomy. Fifty-five % of the objectives were at the knowledge and comprehension levels, while 45% of the objectives were at the higher levels.

Undergraduate courses reflect assignments and activities predominately at the lower levels of the cognitive levels (70%) and none at the evaluation level. Graduate courses, on the other hand, indicate that 55% of assignments and activities are at the lower levels of the domain, with 14% at the evaluation level.

Based on this part of the study, the following conclusions can be drawn:

1. Faculty in our teacher education program with more than three years of university teaching experience identify a greater number and a

higher cognitive level of objectives than those with less than three years of experience.

2. As years of teaching experience at the university level increase, the percentage of objectives at higher levels of the domain also increase.
3. Levels of course objectives do not reflect the levels of activities and assignments as indicated on the syllabi of professors with less than three years experience and more than eleven years.
4. There is a higher percentage of objectives, activities, and assignments at the lower levels of cognition of undergraduate courses than graduate courses. Furthermore, graduate course syllabi reflect the same percentage of high and low cognitive levels for both objectives, assignments, and activities.

Based on this initial descriptive analysis, we believe further investigation is warranted. Recognizing that other variables relative to levels of cognition are operating in the selected 41 courses, we intend to study the following areas:

1. Evaluation devices used by the professor to measure student attainment of the course objectives. If the primary modes of evaluation are tests, then item analysis will be conducted.
2. Formal student evaluations of each course. Those items which relate to student perception of cognitive levels will be correlated with the state objectives, activities, and evaluations.

We are conducting both phases of this study to determine whether the processes used by teacher educators are modeling the instructional behaviors we want our students to exhibit in elementary and secondary schools.

References

Belcher, T. (1975). "Modeling Original Divergent Responses: An Initial Investigation." Journal of Educational Research 67, 351-358.

Bloom, B., and Others (1956). Taxonomy of Educational Objectives, Handbook I: Cognitive Domain. New York: David McKay Co.

Turner, R. L., (1975). An Overview of Research in Teacher Education. In Ryan, D. (Editor) Teacher Education: The Seventy-fourth Yearbook of the National Society for the Study of Education, 87-110.

TABLE 1

Number, and Level of Objectives by Years of Experience

Objectives	YEARS 0-3	4-6	7-10	11+	Total
Knowledge	22	31	67	7	127
Comprehension	0	14	24	0	38
Application	0	11	42	17	70
Analysis	4	2	7	1	14
Synthesis	0	3	9	3	15
Evaluation	0	5	6	3	14
	26	66	155	31	278

TABLE 2

Percent and Level of Objectives by Years of Experience

Objectives	YEARS 0-3		4-6		7-10		11+		Total
	N	%	N	%	N	%	N	%	
Knowledge	22	85	31	47	67	43	7	22	127
Comprehension	0	0	14	21	24	15	0	0	38
Application	0	0	11	17	42	27	17	55	70
Analysis	4	15	2	3	7	5	1	3	14
Synthesis	0	0	3	4.5	9	6	3	10	15
Evaluation	0	0	5	7.5	6	4	3	10	14
	26	100	66	100	155	100	31	100	278

TABLE 3

Number and Percent of Lower Level and Higher Level Objectives by Years of Experience

	0-3		4-6		7-10		11+	
	N	%	N	%	N	%	N	%
Knowledge + Comprehension	22	85	45	68	91	58	7	22
Higher Level	4	15	21	32	64	42	24	78

TABLE 4

Number and Level of Assignments by Years of Experience

Objectives	YEARS 0-3	4-6	7-10	11+	Total
Knowledge	6	34	50	35	125
Comprehension	2	10	16	39	67
Application	3	10	30	15	58
Analysis	3	3	10	2	18
Synthesis	1	4	11	5	21
Evaluation	2	2	13	9	26
	17	63	130	105	315

TABLE 5

Number and Percent of Assignments by Years of Experience

	YEARS								
Objectives	0-3		4-6		7-10		11+		Total
	N	%	N	%	N	%	N	%	
Knowledge	6	35	34	54	50	39	35	33	125
Comprehension	2	12	10	16	16	13	39	37	67
Application	3	18	10	16	30	23	15	14	58
Analysis	3	18	3	5	10	7	2	2	18
Synthesis	1	5	4	6	11	8	5	5	21
Evaluation	2	12	2	3	13	10	9	9	26
	17	100	63	100	130	100	105	100	315

TABLE 6

Number and Percent of Lower and Higher Level Assignments by Years of Experience

	0-3		4-6		7-10		11+	
	N	%	N	%	N	%	N	%
Knowledge & Comprehension	8	47	44	70	66	51	74	70
Higher Level	9	53	19	30	64	49	31	30

TABLE 7

Number and Percent of Objectives by Undergraduate and Graduate Level

Objectives	Undergraduate (N=18)		Graduate (N=23)		Total (N=41)	
	Number	%	Number	%	Number	%
Knowledge	52	40	75	50	127	46
Comprehension	31	24	7	5	38	14
Application	32	25	38	26	70	25
Analysis	9	7	5	3	14	5
Synthesis	5	4	10	7	15	5
Evaluation	1	0	13	9	14	5
	130	100	148	100	278	100

TABLE 8

Number and Percent of Lower and Higher Level Objectives by Undergraduate and Graduate Level

Objectives	Undergraduate		Graduate		Total	
	Number	%	Number	%	Number	%
Knowledge and Comprehension	83	64	82	55	165	60
Higher Levels	47	36	66	45	113	40

TABLE 9

Number and Percent of Assignments by Undergraduate and Graduate Level

Objectives	Undergraduate		Graduate		Total	
	Number	%	Number	%	Number	%
Knowledge	81	63	44	24	125	40
Comprehension	9	7	58	31	67	21
Application	26	20	32	17	58	18
Analysis	6	5	12	6	18	6
Synthesis	6	5	15	8	21	7
Evaluation	0	0	26	14	26	8
	128	100	187	100	315	100

TABLE 10

Number of Percent of Lower and Higher Level Assignments by Undergraduate and Graduate Level

Objectives	Undergraduate		Graduate		Total	
	Number	%	Number	%	Number	%
Knowledge and Comprehension	90	70	102	55	192	61
Higher Levels	38	30	85	45	123	39

THE DEVELOPMENT OF COURSE ASSIGNMENTS IN CHEMICAL ENGINEERING FOR FRESHMEN AND FIRST YEAR GRADUATE STUDENTS FROM CHEMICAL ENGINEERING RESEARCH

by

Richard L. Long, Jr.

New Mexico State University

Introduction

The chemical engineering department at NMSU offers the B.S. and M.S. degrees in chemical engineering. It also offers an interdisciplinary doctorate degree. Research in our department is conducted in kinetics, process control, enhanced oil recovery, two phase flow, and bioengineering. Our department is rapidly evolving into a department having more emphasis than ever before in research. The question then arises: does this mean less emphasis on teaching? The answer is that it means somewhat changed teaching methodologies which lead to both improved teaching and more research. Indeed, one of our faculty is fond of saying that "research is teaching." This is certainly true at the graduate level and can even be true at the undergraduate level when due allowance for background limitations is made.

We have been undergoing fairly rapid changes in the undergraduate and graduate courses while remaining largely within the same course structure. Last year, I reported to this conference on the implementation of our Guide to Writing and Problem Solving for Chemical Engineers. Since then, we have had a contract offer from one commercial publisher and a feeler from a second for our Guide. What is the longer range goal of our efforts? To strengthen our department at all levels. This means building on the sound foundation of developing basic skills. But more than this, by incorporating an increased research component into both undergraduate and graduate classes, we enhance student motivation and give the student a vision of where his chosen discipline can lead. This is important because the work load can be very heavy. The heavy work load is required to make the student capable to handle the sometimes subtle and difficult problems he must face in his professional life. Professional life in chemical engineering can have important components of technical and economic evaluation, hands-on operation, and interpersonal interaction. Chemical engineers work in a very wide variety of organizations. Thus, a sense of confidence, competence, and vision should be instilled in our students. This will make their success in our rapidly changing world more likely.

Skills Needing Development

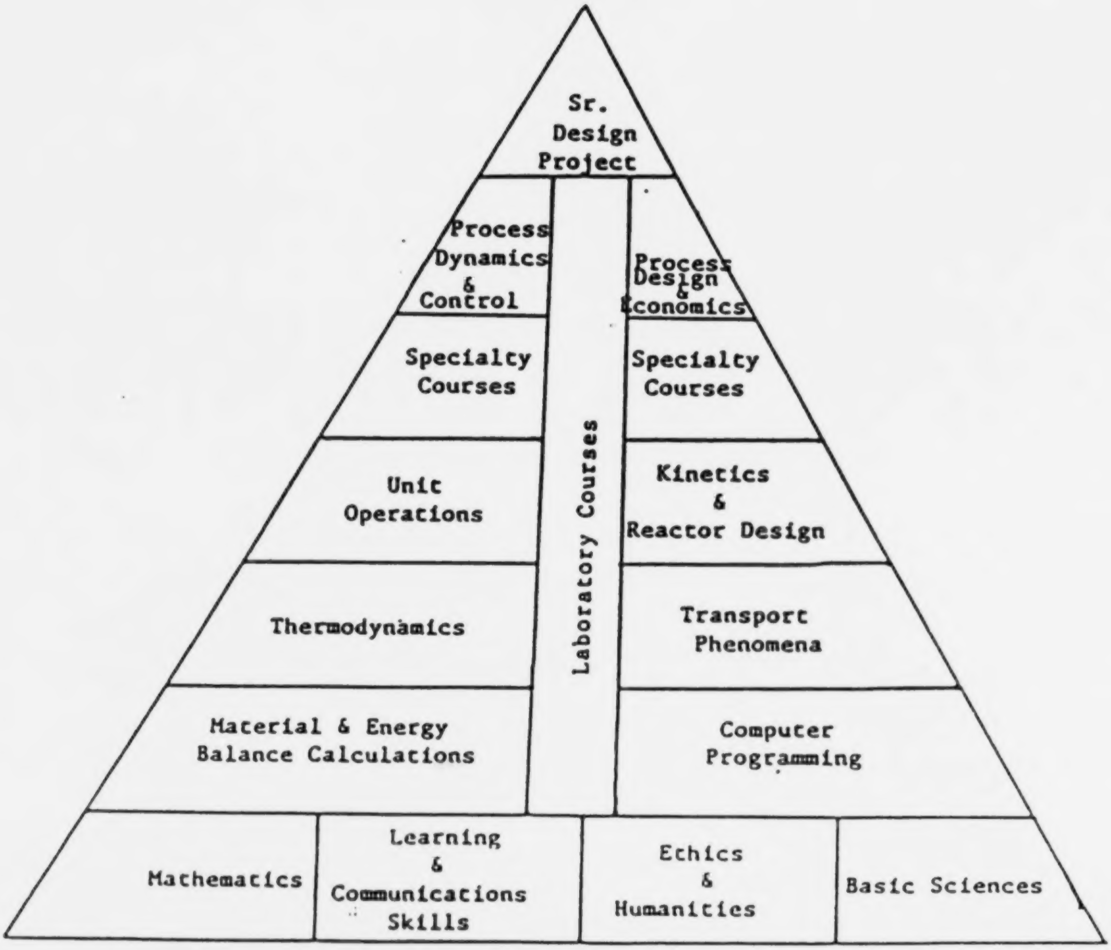
If research is to enhance teaching, then we must pose the question: what is it that we want our students to learn? Since technology and culture change over time, we want first to have our course materials up-to-date at all times so that the factual content is both accurate scientifically and reflects current practice. This means that a continual upgrading of course materials is required. Research can help in this effort by keeping the curriculum at the "leading edge" of practice. Second, we want to be sure that our students graduate knowing how to think and learn for themselves. This second grouping of skills is especially enhanced by developing course assignments from research.

An ABET accredited undergraduate chemical engineering curriculum model is shown in Figure 1.

This organization emphasizes the "content." Content is, of course, crucial to producing competent graduates. But we must remember that content based education is also a way of conveying skills. Table I is a listing of some of the skills important to chemical engineers in practice. Figure 2 presents a graduate curriculum model.

Keeping in mind that both the freshman and first graduate student courses are where the instructors encounter the greatest heterogeneity of student populations, how can we build student motivation, give a "vision", and keep the instruction in balance so that we can rapidly bring all (or most) students to a high level of skill development? This is one of the real "arts" of the teaching profession. As we all know, some students have to be pushed, some have to be pulled, and some have to be sat on.

The insertion of tasks based on current research problems as course assignments into the curriculum at the "beginning" student level is especially effective at focusing the attention of all students on the task. Our experience has been very favorable indeed with course assignments developed from on-going research programs. When the assignments are reasonably matched to the level of student preparation, they do indeed capture the imagination of the student. Because the student knows that he is confronted with a part of a "current" problem in technology, students usually finds the problem highly interesting. Indeed such assignments are usually sufficiently motivating to the student to encourage him to maximum effort regardless of any deficiencies in background he may have. Thus research based course assignments go a long way towards raising overall student performance levels in our classes.


Sr. Design Project
Process Dynamics & Control
Process Design & Economics
Specialty Courses
Specialty Courses
Laboratory Courses
Unit Operations
Kinetics & Reactor Design
Thermodynamics
Transport Phenomena
Material & Energy Balance Calculations
Computer Programming
Mathematics
Learning & Communications Skills
Ethics & Humanities
Basic Sciences

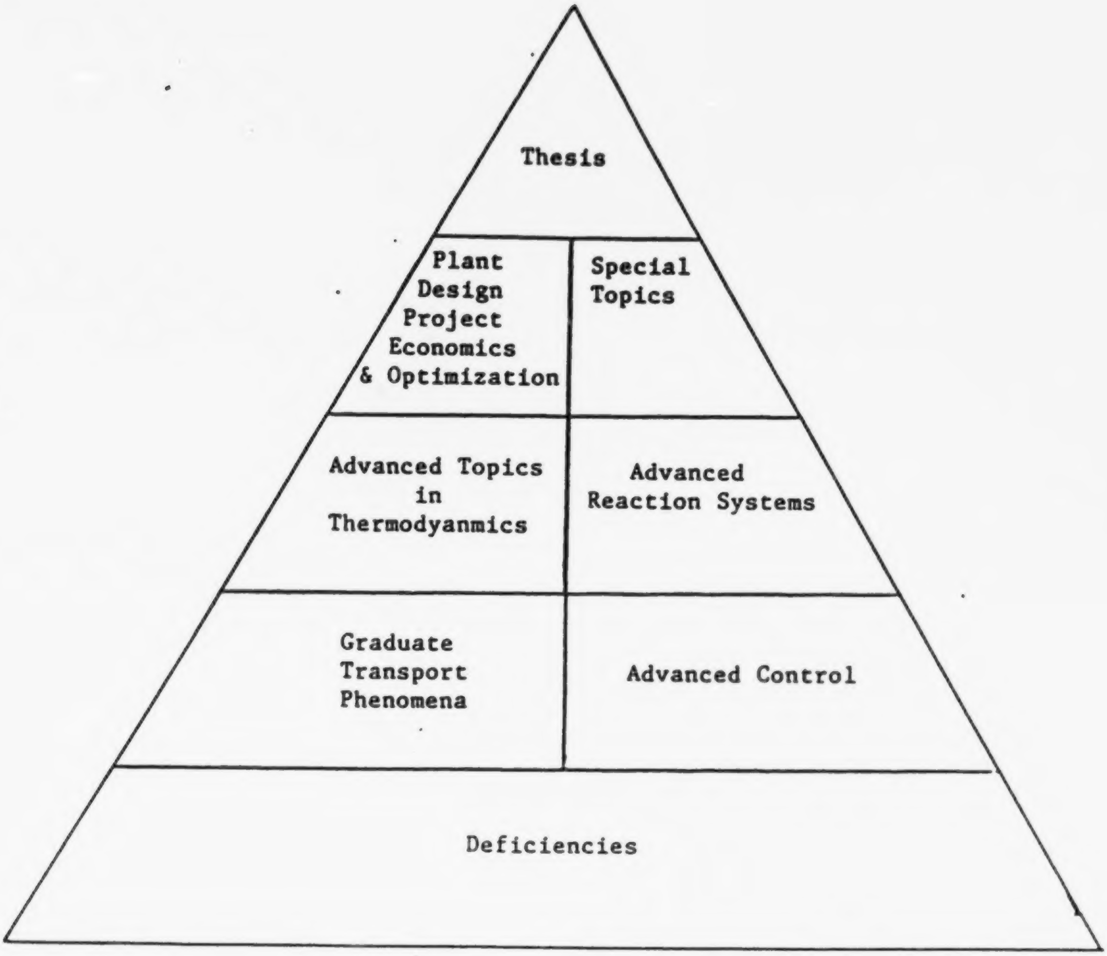
An Undergraduate Chemical Engineering Curriculum Model

Figure 1

TABLE I

Important Skills for Chemical Engineers

Skill	How Taught
Writing	Report Assignments
Problem Solving	Homework
Programming	Problem Assignments
Information Retrieval	Library Research for Special Problems/Projects
Critical Evaluation	Design Projects
Systematic Observation	Laboratory
Handling Apparatus	Laboratory
Safety	Laboratory


Thesis
Plant Design Project Economics & Optimization
Special Topics
Advanced Topics in Thermodyanmics
Advanced Reaction Systems
Graduate Transport Phenomena
Advanced Control
Deficiencies

A Graduate Chemical Engineering Curriculum Model

Figure 2

TABLE II

Example Course Assignments Developed from Research

Student Level	Course Assignment	Source
Freshman	Computer Programs	Two Phase Flow Project – data treatment
Freshman	Technical Report Writing	Closed Cycle Greenhouse Project
Freshman	Memorandum Writing	Two Phase Flow Project
First Year Graduate	Dimensional Analysis	Two Phase Flow Project
First Year Graduate	Mass Transfer Modeling	Rising Thin Film Absorber Project (Patent Pending)
First Year Graduate	Axial Migration Model	Two Phase Flow Project

Example Course Assignments

While the knowledge and skill levels of freshman and first year graduate students are vastly different, there are some parallels between the two groups. These parallels are based on the fact that both groups are at the beginning of a new phase in their educations. Since the methods and emphases of the undergraduate and graduate curricula are different from the previous experience of the student (high school for one group and undergraduate education for the other group), the student is comparing his expectation to what he actually encounters. Thus, the introductory courses at both levels are crucial to the student's perception of what he can expect to get out of the curriculum. It behooves us, as educators, therefore, to make these beginning courses as interesting as possible for the student.

In our department we have used tasks related to several ongoing research projects as the basis for course assignments at the freshman and first year graduate level. These are summarized in Table II.

Conclusions

Education in chemical engineering at the undergraduate and graduate levels consists of both content and skill development. It is therefore essential to keep content current and insure that the teaching methods develop the desired student skills. In this way, we enhance the general level of success of our graduates. The development of course assignments from research helps us to maintain currency in course content and enhances skill development in students by increasing their interest in the task at hand.

References

1. Lipowicz, M.A., and Hughson, R.V., "Putting College Back on Course," Chemical Engineering, September 19, 1983.
2. Long, R.L., "The Importance of Writing to Chemical Engineers," First Regional Conference on University Teaching, NMSU, 1985.
3. Long, Barna, Bridges, Rakow, A Guide to Writing and Problem Solving for Chemical Engineers, Kinko's Publishing Group, Santa Barbara, CA, 1986.

AN EVALUATION OF A SIMPLE COMPUTER-AIDED INSTRUCTION SYSTEM FOR UNDERGRADUATE CIVIL ENGINEERING

by

Randy B. Machemehl

The University of Texas at Austin

An Evaluation of a Simple Computer-Aided Instruction System
for
Undergraduate Civil Engineering

By R. B. Machemehl

Undergraduate students in Civil, as well as, other branches of Engineering face a significant challenge represented by curricula increasing in depth and breadth. While numbers of degree-required hours have not changed significantly in most engineering programs in recent years, the content of many courses has changed dramatically. The general tendency in revising courses has been to expand the scope in order to encompass new material, while placing more burden on students to independently learn background material. This situation is typically most severe in the Civil Engineering courses which introduce junior level students to each of several major topical areas. One of these "survey" courses is "Introduction to Transportation Engineering" which supposedly introduces students to the area but may be the only Transportation course taken by many students.

The scope of the introductory Transportation course has been expanding annually as the course is evaluated and modernized. However, increases in scope have not been accompanied by increases in lecture time, but rather, by increased requirements for students to learn older "background" materials on their own. A technique of supplementing classroom instruction has been sought as a means of assisting students in their quest to master the growing list of "background" materials. A system of computer-aided instruction (CAI) is one of several techniques which has been suggested as a partial solution. A significant by-product of student use of a CAI system would be the familiarity they might acquire through use of common computer hardware. Therefore, initially enabled by a grant of computer hardware by IBM, development of a CAI system for the introductory Transportation Engineering course at the University of Texas at Austin was begun in the fall of 1984.

Structure of the CAI System

Examination of computer-aided instruction systems developed for other engineering courses revealed that most systems required extensive effort in computer code development and in many cases, special hardware systems. Despite the fact that neither extensive manpower for code development, nor exotic hardware systems were available, a CAI system was chosen as the most promising solution.

The constraints within which the CAI system was designed were quite severe, yet quite common for most engineering programs. Access to micro and main-frame computers could be provided by the department, however, technician assets for writing, entering, and debugging computer code was really not available. Therefore, the system would have to be designed so that it could be easily coded, entered, debugged, and updated largely by volunteer student and faculty labor.

A micro-computer environment was chosen as more desirable than the mainframe because of the ease with which graphics and sound can be produced. These user amenities were considered rather important because they enhance the desire of the prospective user to explore the CAI system, thus causing him to spend more time and hopefully receive more benefit.

The system was designed to encompass four functional types of files which have been called help, demonstration, homework assignment, and problem solution files. Help files are simply text files which provide instructions on everything from the system itself to portions of reference materials and class notes. Demonstration routines utilize graphics to illustrate basic principles and functional relationships. Some of these routines allow real time user interaction while others require that a demonstration scenario be completely specified before beginning. Homework assignment files provide the only source of instructions and data required for solution of homework assignments. Since hardcopy versions of homework problems are not provided, all students must use the CAI system, at least, to gain access to homework assignments. Problem solution files provide the user with special sets of code for solving problems which are of the same generic class as assigned homework problems. These files can be used to check proposed homework solutions, but never as a substitute for manual problem solutions.

The majority of the system has been coded in ANSI Standard "FORTRAN 77". The choice of this language was dictated largely by the desire to maximize the ease with which the system could be adapted to several types of micro-computers. A specially enhanced version is being prepared for use on the Apple Macintosh. The "toolbox" utility available under the ABsoft (now Microsoft) FORTRAN system provides easy access to the Macintosh ROM routines which enable marvelous graphics and the current "ultimate" in user friendliness. The first version of the CAI system is intended to be essentially operational on either Macintosh or IBM PC equipped with an ANSI Standard FORTRAN compiler. The enhanced version will represent a significant gain in user friendliness and graphical presentation with a loss in transferability.

Due to the basic composition of the Transportation Engineering course and the quantity of code the system was divided into three parts. The system components are illustrated along with their relationships in Table 1. As noted in the table, the system components are identified as modules. Each of these semi-independent elements can be removed or replaced without disrupting the integrity of the system. The "modular" construction enhances the ease with which components can be updated and permits simultaneous repairs by several maintenance workers. The modules are not, however, completely independent in that data and output files must be passed among the components. In order to enable communication among the parts, a basic set of rules for input and output file composition was adopted. All files are formatted so that users may examine them easily and common field widths are used for integer and decimal numbers. Additionally, all output files are formatted so that they comsume 80 columns of page width or less.

Table 1. CAI System Components

Section	Module	Numbers of Files by Type Help	Demo	P.S.	H.W.
1	1.1 Linear regression	1	2	1	1
	1.2 Trip generation	1	1	1	1
	1.3 Trip distribution	1	1	2	1
	1.4 Minimum paths	1	1	1	1
	1.5 Assignment processes	1	2	0	1
2	2.1 Resistance to motion	1	2	1	1
	2.2 Propulsive force	1	1	1	1
	2.3 Acceleration/deceleration	1	1	1	1
	2.4 Flow in discrete systems	1	0	0	1
3	3.1 Intersection design	2	1	1	1
	3.2 Interchange characterization	1	0	0	0
	3.3 Geometric design	2	1	2	2
	3.4 Pavement design	1	1	1	1
	3.5 Airports	1	1	1	1
	3.6 Mass transport systems	1	0	0	0
Totals		17	15	13	14

System Evaluation

Considerable effort has been expended in designing and implementing the simplistic CAI system, however, effort even combined with clever programming will not necessarily yield a product that really enhances the learning process. Development of such a product can best be accomplished through a series of incremental adjustments and improvements guided by a structured development plan. With this concept in mind a four phase evaluation plan was developed. Components of the plan and estimated time scheduling are identified in Table 2. As noted in the table, the first phase began with pilot testing of components during the fall 1985 semester and will continue through the fall 1986 semester. The spring and fall 1986 semesters will encompass two repetitions of data collection.

The plan is designed to provide feedback regarding two basic measures of effectiveness which include user perceptions of system utility and objective measures of system impacts upon achievement. The former is to be provided through a series of student surveys conducted in concert with usual class evaluations. The latter is to be accomplished through a specially designed experiment in which student grades can be compared. While user perceptions can be rather easily obtained, development of an environment in which grades can be used to assess the effects of the CAI system is somewhat more difficult. Obviously, many things in addition to the use of CAI can cause student grades to be significantly different. Differences in individual ability, as well as, differences in instructor techniques could have major effects.

In order to reduce the effects due to different student abilities, a simulated paired experimental design was chosen, as one section of the undergraduate Transportation course was divided into halves with approximately equal academic records both in terms of hours taken and grade point averages attained. One half is to be instructed to use the CAI system while the other is to be told to avoid even talking about the system with their classmates who were using it. A single class was chosen, rather than several sections, in order to minimize potential effects due to differences in classroom experiences. Theoretically, the major difference in learning experiences of the two halves of the class will be that provided by the CAI system.

Differences in time spent by the two halves of the test class while studying materials either with or without the CAI system represent a major variable which cannot be controlled. Pilot tests of the system indicate that students tend to spend more time working with course materials when using the system. If this trend is confirmed through the primary evaluation process, questions regarding the

Table 2. Evaluation Plan

Phase	Activity	Scheduled Time
I	Pilot test modules Debug code Refine elements	Fall 1985
II	Select test population Implement full CAI system Collect comparative scores Collect student comments	Spring 1986
III	Analyze scores and comments Revise/improve/modify system	Summer 1986
IV	Select test population Collect 2nd generation test data	Fall 1986

efficiency of learning through CAI might be raised. Part of the evaluation questionnaire to be completed by each student includes a series of questions regarding time spent preparing for each course element. These data, while not completely robust, will provide a means of assessing the efficiency question. However, the pilot testing also indicated that poorer students who used CAI expended more study time and tended to attain better test scores than those who did not use the system. Unfortunately, no firm conclusions can be drawn from results of the fall 1985 pilot tests because only parts of the system were used by very small numbers of students.

Summary

A simple CAI system has been designed and is being implemented in an undergraduate Transportation Engineering course. The system is implemented on commonly available micro-computers utilizing no special hardware. System design and coding was done without the involvement of specialists in computer science or CAI utilizing volunteer student and faculty labor in entering and debugging code. Preliminary evaluation of the pilot system indicates high student satisfaction and improved grades for those using the system.

A four phase evaluation program encompassing approximately 18 months has been designed and implemented. The evaluation includes two repetitions of data collection consisting of both student perception and achievement.

APPLYING STUDENT DEVELOPMENT THEORIES TO ACADEMIC AND NON-ACADEMIC QUANDRIES

by

Jerome A. Schaffran

The University of Rhode Island

Applying Student Development Theories to Academic and Non-Academic Quandaries

Dr. Jerome A. Schaffran

University of Rhode Island

Allow me to take a moment to define some of the terms in the title and to explain my role in this research.

Student development theory refers to theories or models usually derived from general adult development or learning theories and are specifically applied to the college population. In this presentation, theorists representing the former are Chickering, Perry and Kolb. Many of you may be familiar with their work and of the more general theories they use as their conceptual base, i.e., Erikson, Gould, Levinson, Vaillant, Loevinger.

Academic and non-academic quandaries are those questions that arise in those reflective moments as you look over your final grade sheets and the student evaluations. How could she have flunked this course? Who are those students who didn't like my course and what do they want? Or, it could be those times when a counselor, or residential life administrator, or a president asks: Who are those people who need so much help? Should an institution of higher learning offer basic study skills assistance? Should a residence hall be more than a boarding room for students? Should athletes strive to achieve more than the next winning season? Not exactly Nobel prize winning quandaries, but pervasive and persistent enough to warrant discussion.

I have the enviable position of chairperson of a department of Human Development, Counseling and Family Studies. That position brings me into contact with many departments and offices at our University. I also coordinate a Master's program in college student personnel services, which often puts me into various student affairs offices as a supervisor of interns. My research interests are in the application of adult development and learning theory to college student populations.

One other piece of institutional information you should know. We have a very active and successful faculty instructional development program at the University of Rhode Island. Many of my contacts with other departments are initiated by that office when they encounter a faculty member expressing interest in exploring a classroom quandary. Over the years, I have worked with departments in engineering, oceanography, nursing, human sciences and services and many departments from arts and sciences.

Academic and Non-Academic Quandaries

What is a quandary? Here are some recent examples from a variety of settings. From a nursing instructor teaching human sexuality: Why are some student attitudes about pregnancy and abortion so rigid, even though they know the course material? Will their rigidity affect the nurse/patient relationship? From a chemistry instructor in first-year chemistry: Why do some of the brightest students fail chemistry? Can chemistry be taught in a way to accommodate all or most students? (Of course this last question is the bottom line to all our quandaries. It would be nice to know the answers to the questions, but can we do anything about it after we have an answer.)

From a non-academic setting, we have this quandary from a study skills counselor: Why is it that so many students referred to us have reasonable skills but can't seem to apply them to coursework in their major? Or, from a residential life administrator: How can we demonstrate that we do as much to develop students as any regular classroom? From a varsity coach: How can we show that we develop students in other areas other than stress and competition?

As you can see, these questions are fairly ubiquitous, and usually left to armchair speculation, rationalizing in annual reports or funding proposals, or serious discussions with administrators determined to cut the budget.

Designs to Address Quandaries

Most of these quandaries have an embedded developmental question...or they appear to have from someone who sees the world through a developmental lens. One big question here is, are these quandaries asking about personality types or stages of development? If they are types, then they are probably fairly stable and the remedy is to ease the student out of the environment or make major accommodations in the instruction. If they are stages, then carefully designed instruction might be able to gradually move the student through the material without compromising the integrity of the course. This would be next to impossible if instructors had to design and execute several lessons for the various learning stages or styles. However, if an entire group of students is at the same stage or of the same type, then perhaps differentiated instruction can be implemented efficiently. A third, and more likely, possibility is that learners bring in a fairly stable learning style at a particular stage of thinking.

The nurse, chemist, and study skills counselor are all asking the stage or type question. We designed a set of instruments to assess William Perry's scheme of intellectual/ethical development. They require students to report such things as the best and worst classes they have taken and why, their view of a good instructor, a good student, of the other students in class, and to provide metaphors for the ideal learning environment. These surveys are then scored or rated by trained readers to provide an estimate of the student's stage. To provide information on learning style we have used a more standardized instrument to assess David Kolb's four learning styles. The nursing and chemistry students are tested twice a semester each year they are in the curriculum. Longitudinally, we will be able to relate success rates, classroom attitudes and satisfaction, attrition and transfers to stage and style.

The residential life administrator and coach also have similar questions albeit much broader than the questions raised above. They are essentially asking about general adult development or maturity, not just cognitive development. For these questions, we designed two instruments following Arthur Chickering's vectors of college student development and a combination of Chickering's vectors, Drum's modes of development model, and Hettler's Wellness model. The first instrument was sent to Division I, II, and III women's volleyball coaches around the country. It was designed to assess opinions of their players' development related to their coaching style. The second instrument was given to resident hall dwellers to assess their level of developmental wellness and to use as a needs assessment to design interventions. The instrument will be readministered each fall and spring. From these data we hope to answer the question of how to assess and monitor development in residents and athletics.

These variables serve as both independent and dependent variables in classroom research. We are certainly interested in their relationship to the classroom questions or quandaries raised by the instructors, administrators and coaches, but we are also interested in changes in these variables over time.

Outcomes

What have we found? I offer a surprise ending. First, when used as an independent variable, we have found relationships between developmental stage, styles of learning and success and satisfaction. Students who are rigid in their attitudes, less satisfied with conceptual instruction and student discussion groups are frequently classified as "dualists" in Perry's model and "convergers" in Kolb's model. Students who were having study skills difficulty in their major partly fit the same profile, that is, they tended to be "dualistic" but their learning style tended to be mis-matched with their selected major. There are several implications for intervention here: 1) Since students in the dualistic stage tend to need much more structure, more teacher/less student discussion and more concrete/ less abstract presentations, the nursing and chemistry courses have attempted to provide the supportive structure with periodic instructor challenges to attitudes, beliefs and knowledge. For the study skills counselor, we would recommend referral to both an academic advisor and career counselor. Students are increasingly opting early for the impacted, glamourous majors without regard to their own temperament. They may have basic smarts, but not the type of thinking required by the discipline.

The student maturity assessments are just now being analyzed. Preliminary findings from the resident halls confirm both a sequential pattern to personal development/wellness (a within student comparison), and evidence of systematic integration of vectors as the student ages (cross-sectional comparisons).

The Surprise

The most interesting finding of these studies has little to do with student outcomes. Some of this research is tedious, scoring the instruments is often a nightmare, and the implications and interventions are often tenuously speculative. So why do it?

We have found that many instructors, counselors, administrators, coaches, etc. derive little satisfaction from coursework that has no larger meaning, that has no intellectual or emotional impact. Hence, the quandaries. And, when someone introduces hypotheses to answer the questions, they have renewed interest in their work with students. They spend more time questioning, designing, implementing, evaluating and being concerned about student variables. They are still concerned with the theory and models of nursing, chemistry, physics, learning, and coaching, but they also now have the additional stimulation of instructional meaning.

Consequently, I believe the real effect of this type of research is indirect. That is, it stimulates the user to observe and do things they normally wouldn't see or do. Students reap the residual benefits. It is also a way to begin renewal with those tired, uninspired, oppressed and unproductive faculty. As both a developmentalist and a chairperson, I have a selfish interest in that renewal.

References

Chickering, A.W. Education and Identity. San Francisco: Jossey-Bass, 1969.

Chickering, A.W. and Associates. The Modern American College. San Francisco: Jossey-Bass Publishers, 1984.

Drum, D. "Understanding Student Development." In Weston H. Morrill and James C. Hurst, Dimensions of Intervention for Student Development. New York: John Wiley and Sons, 1980.

Erikson, E.H. Identity: Youth and Crisis. New York: Norton, 1968.

Fuhrmann, B.S. and A. Grasha. "Designing classroom experiences based on student styles and teaching styles." In A Practical Handbook for College Teachers. Boston: Little, Brown and Company, 1983.

Gould, R.L. Transformations. New York: Simon and Schuster, 1978.

Hettler, B. "Wellness: Encouraging a Lifetime Pursuit of Excellence." Health Values: Achieving High Level Wellness, 1984, 8, 13-17.

Knefelkamp, L., et al. (Eds.) New Directions for Student Services: No. 4, Applying New Developmental Findings. San Francisco: Jossey-Bass, 1978.

Kolb, D. The Learning Style Inventory: Technical Manual. Boston: McBer, 1976.

Levinson, D.J. and others. The Seasons of a Man's Life. New York: Knopf, 1978.

Loevinger, J. Ego Development: Conceptions and Theories. San Francisco: Jossey-Bass, 1976.

Perry, W.G., Jr. Forms of Intellectual and Ethical Development in the College Years: A Scheme. New York: Holt, Rinehart and Winston, 1970.

Vaillant, G. Adaptation to Life. Boston: Little, Brown and Company, 1977.

RESEARCH AND RELEVANCE IN THE UNIVERSITY: THE CASE FOR ANTHROPOLOGY

by

Steadman Upham

New Mexico State University

INTRODUCTION

Because college students are uniquely positioned upon graduation to assume the rights, duties and obligations of leadership within our society, national and international events often have profound effects on them and, by definition, on the curricula that are designed to help them meet their own and society's needs. Such was the case during the 1960s when the effects of student activism resulted in major modifications to standard university curricula in the United States. Changes in course offerings and course content were made in virtually every college and university in the country. Such changes were prompted by a new-found ethnic awareness, a need to create popularized, if conflated versions of technical science courses (e.g. Ecology 100) and academic recognition of self-designed curricula and self-paced courses. New universities were even founded on these principles. In the 1960s and early 1970s these curricula changes were seen as academic *solutions* to the relevance problems raised by a national and international crisis of confidence. That crisis was caused by civil unrest and a counter-culture ethos at home, the Vietnam war and deteriorating perceptions of the U.S. military-industrial complex abroad. Today most educators have a much different view of the academic solutions devised during the late 1960s, but for college students the problems of academic relevance remain.

Twenty years ago student activism on college campuses across the nation was manifest not only in a heightened awareness of important social issues like civil rights and the morality of war, but also in an increased curiosity about other peoples, other countries, and especially other cultures and belief systems. The chief beneficiaries of this social activism on many college campuses were disciplines in the humanities that offered comparative, cross-cultural curricula. Anthropology departments were among such disciplines, and students saw anthropology courses as offering a comfortable round trip ticket to global cultural and ethnic diversity for the price of three credit hours. Driven by these social tides, enrollments in undergraduate and graduate anthropology programs peaked in the early 1970s.

Today, social activism is still very much in evidence on college campuses. In contrast to the 1960s, however, the social activism among contemporary students is stimulated by national socioeconomic issues. A precarious relationship between habitual deficit spending at the federal level, record trade deficits, and a ballooning national debt have heightened interest both in careers and in assessing the long term financial consequences of choosing a field of study. This situation, coupled with a general swing toward political conservatism in the country, has affected the curricula of colleges and universities. Those disciplines offering practical and tangible benefits in the form of guaranteed employment upon graduation (engineering, computer science, and business) have benefited most from this recent activism. Enrollments have increased dramatically and curricula have been expanded in these fields, often at the expense of enrollments and programs in the humanities.

As an anthropologist I am concerned not only about declining enrollments in my own field, but also about the cost/benefit decisions made by students *and* administrators that often appear to sacrifice the long term advantages of a broad liberal education. It is clear, however, that students and administrators are responding to the same social stimuli and, particularly for state-funded colleges and universities, that stimulus is translated in state legislatures to funding for disciplines and programs with large enrollments. Because colleges and universities operate in the marketplace they are driven by the same market forces of supply and demand that result in the price of everything from textbooks to a college education.

In this paper I consider how the problem of declining enrollments can be overcome. Although my discussion pertains strictly to anthropology, the relevance of my proposals for the rest of the humanities should not be overlooked. From a structural perspective, I maintain that the problem of declining enrollments is one of perceived academic relevance in light of the way today's students define social activism. From the student's perspective any solutions that are constructed must deal effectively with the student's immediate socioeconomic problem: employment after graduation. Educators also have an obligation, however, to provide for the student's long term intellectual needs: to supply a foundation for continued intellectual, social, and psychological development. From the standpoint of faculty and administrators in universities, the only acceptable long-term solution to the enrollment and, hence, the relevance problem, is one that solves the problem on three separate but interrelated fronts: 1) increase total enrollments, 2) increase undergraduate and graduate majors, and 3) expand curricula and faculty. I maintain that the solution to the problem is not provided by offering service courses to other departments, although this is something that occurs routinely on most campuses. Rather, the solution lies in addressing the problem of academic relevance directly.

THE ENROLLMENT PROBLEM IN ANTHROPOLOGY

Interest among students in the four traditional subfields of academic anthropology (archaeology, cultural anthropology, physical anthropology and anthropological linguistics) has decreased, and anthropology departments have experienced serious declines in enrollment during the last decade. Detailed statistical analyses of enrollment trends in anthropology for the academic years 1977-78 through 1984-85 have been compiled by Whitney (1985) and Ward (1985). Although more complete longitudinal data are desirable, the unmistakable message of these data is that anthropology is in trouble. During this seven year period, enrollments declined dramatically in all but PhD-granting departments. As Whitney states,

> BA departments showed the greatest drop, 18.1%, and MA departments declined 15.8% from the 1977-78 levels. Between 1982-83 and 1984-85, enrollments in advanced undergraduate courses fell, continuing a trend seen in previous surveys, Introductory course enrollments

> increased in PhD and MA departments, but declined in BA departments.....The ratio of introductory to advanced enrollment continued to climb----in all but BA departments----reaching a high of 2.5 introductory courses for each advanced course in 1984-85. During the same period this ratio was increasing in PhD departments, both the enrollment figures and the number of majors and degrees were *decreasing*, very likely a reflection of the increased emphasis on offering service courses to other departments. BA departments, meanwhile, experienced the greatest enrollment drop during the same period they reported offering 25% fewer introductory courses for each advanced course (1985:1).

Overall, total undergraduate enrollments have dropped nearly 15%, and total undergraduate majors 28% during this seven year period (Ward 1985:20). At the same time, the number of BA, MA and PhD degrees granted in anthropology dropped by almost 44%. These drastic declines have been reflected in the employment of anthropologists, at least in universities. From 1979-80 to the present, for example, there has been an 11% drop in the number of assistant professors, but the number of associate professors has remained constant. In addition, the number of anthropologists teaching at the instructor level declined from nearly 10% in 1979-80 to fewer than 2% in 1984-85.

When academic disciplines like anthropology exhibit declining enrollments over a period of several years, the enrollment figures are normally a sign of general stagnation in the field, with all major indicators and especially employment showing downward trends. Fortunately, this situation does not hold true for all of anthropology. At the same time that interest among students in anthropology as a profession has been declining, advanced course offerings dwindling, and degrees granted decreasing, the overall employment picture for anthropologists has actually improved. Tangible employment gains large enough to offset the losses in the academic sector have been made in the applied fields of international development, social impact assessment, historic preservation, forensic and applied biomedical anthropology, and museology. Employment opportunities for anthropologists in all of these fields have expanded during the last decade, yet in most universities, anthropology curricula, especially at the undergraduate level, continue in the same traditional mold as during the period of anthropology's peak popularity. What this means is that students who are not exposed to these applied fields in anthropology often have no knowledge that an expanding job market exists; that employment opportunities offering the expectations of a reasonable income, travel, and employment stability in the future are available. Such students include lower division undergraduates who might continue in anthropology were it not for mistaken perceptions regarding future employment. In other words, even though anthropology may be perceived as an interesting field of study by students, it is considered irrelevant by the standards of today's student activism.

SOLVING THE RELEVANCE PROBLEM: RESEARCH IN THE CLASSROOM

Among many people, academics included, the term "research" in the humanities often conjures up some narrowly specialized endeavor, conducted in private by a group of scruffy, unwashed professionals. In such conceptions, research rarely has any practical applicability and most often serves some esoteric function that can only be appreciated by understanding a seventh order polynomial or self-generating algorithm. I construct this somewhat extreme scenario not only for effect, but also so I can repeat what William May said one year ago in this conference about teaching and research. He said,

> Broadly conceived, teaching includes not only the instruction of students but the teaching of colleagues. Writing for publication

> is part of the transmission of knowledge. Faculty members engage in teaching when they write articles, monographs, book reviews and books. It is teaching without a classroom, teaching to a wider audience of peers, who may or may not yet be engaged in a similar *research enterprise* (1985:8-9 *emphasis added*).

If one accepts May's reasoning, and I do, linking the normally separate domains of teaching and research into a single coherent entity means that only one domain actually exists. Depending on one's preference, there is only *teaching* or there is only *research.* It matters less how one handles this linkage semantically, however, than how one actualizes it as a professional.

Earlier in this paper I noted that any solution to the relevance problem in anthropology must meet students' needs regarding employment. I contend that such a solution will also solve the problem of declining enrollments, decreased numbers of majors, and shrinking programs and faculty. From a descriptive standpoint, the solution to this seemingly complex problem is a simple one: make the role of anthropology in the marketplace and the employment of anthropologists major concerns in anthropology curricula. In the remainder of this paper I discuss how this kind of solution might be achieved. I maintain that the use of disciplinary research is a key element in developing such course curricula.

Resolving the Employment Dilemma: The Key to Increased Enrollments

Making anthropology relevant to today's students means that anthropology must be placed on the same footing with disciplines offering what is perceived by students as more standard or traditional forms of employment. Most students' perceptions of "doing anthropology" place anthropologists in some distant and remote land, studying the esoteric rituals of a vanishing people. While such work does take place in anthropology, it is increasingly rare today. Much more common are the kinds of jobs that exist in the United States and place anthropologists alongside business people, medical doctors/researchers, health care specialists, elected officials, and federal, state and local bureaucrats of all kinds. Consequently, a professor's first obligation to students is to inform them of the myriad opportunities for employment in anthropology. A beginning point is to consult the literature on employment opportunities published by the American Anthropological Association (Belden n.d. a, n.d. b) or the Anthropological Society of Washington (e.g. Landman et al. 1981). More important, however, is to structure anthropology curricula *at the undergraduate level* to reflect the training and expertise necessary to tap this job market. Integrating disciplinary research into the curricula is the single most important part of this process.

Most of the employment opportunities available for students graduating with a BA or BS degree in anthropology today are in three separate areas of anthropological training: historic preservation, also known as contract archaeology or cultural resources management, biomedical anthropology, and international development. Naturally employment opportunities expand, and remuneration increases in these fields with advanced training. Nevertheless, jobs do exist for the well trained undergraduate in anthropology. Employment in the field of historic preservation provides a case in point.

Slightly more than a decade ago, employment for archaeologists outside universities was uncommon. Most jobs required an advanced degree; jobs for the well trained BA anthropologist were virtually nonexistent. The passage of federal legislation mandating consideration of the effects of federal undertakings on historic and prehistoric archaeological properties drastically changed this situation. Today, the federal government oversees the expenditure of more than $200,000,000.00 annually for archaeology. Contract archaeology has accounted for the single largest employment gain in all of anthropology since 1974. The result of this tremendous growth has been beneficial for trained anthropologists with and without advanced degrees. BA anthropologists with a specialization in archaeology probably have filled the majority of jobs that have been created, since the need for field archaeologists has been greatest; supervisory positions are nearly always staffed by MA or PhD archaeologists.

The tremendous growth of cultural resources management has been accompanied by a concomitant growth in archaeological research associated with such projects. Bringing the results of this research into the classroom can be accomplished in two different but compatible ways. First, the results of current cultural resource management projects can be used to present information in lecture and discussion on such fundamental topics in archaeology as research design preparation, probabilistic sampling and data acquisition strategies, site significance, methods and techniques of analysis. If one does not participate in a cultural resources management program directly or have ready access to the research results of such projects, information on current cultural resources management studies is available through a variety of professional journals. Consequently, any professional can use the results of current research to teach the fundamentals of archaeology.

Second, using the research results from current cultural resources management projects permits discussion of the management aspects of doing archaeology in the marketplace. While archaeology still requires a great number of specialized scientific skills, the growth of cultural resources management as a field also means that archaeologists must possess business acumen, an understanding of federal laws and regulations, comprehension of the federal procurement system and, most importantly, what professional standards and ethics mean in a contracting situation. In this case, the use of current CRM research as a basis for classroom study facilitates examination of the legislative mandates governing different kinds of projects, the tactics of federal contracting, the client-professional relationship, project staffing and budgeting. When such curricula changes are instituted, it is rarely the case that an archaeologist graduates without knowing the history of cultural resources law, the difference between an RFP, RFQ and IFB, what constitutes conflict of interest, how much it costs to excavate a site, what level of effort is required, and what time frame is reasonable to complete a project. At the same time, the student is aware of on-going research and how state-of-the-art methods and techniques of investigation can be used to resolve specific archaeological problems.

Although the example described above is unique to archaeology, cultural resources management projects commonly include cultural and physical anthropologists, public historians, specialists in historic architecture and art, and scientists and scholars from many other fields (e.g. biology, hydrology, palynology, physics, geography, geomorphology, geology, and even astronomy). Consequently, the potential exists through the field of cultural resources management to incorporate the disciplinary research from at least a dozen fields into the humanities curricula. It should also be noted, however, that other fields of applied anthropology have an equal or greater potential. The field of international development, for example, relies on the expertise not only of cultural anthropologists, but also rural sociologists, political and economic geographers, agricultural economists, range and wildlife experts, and a host of more specific humanistic and scientific fields. In other words, the model of incorporating current disciplinary research into a revised curricula is broadly applicable to most fields in the humanities.

CONCLUSION

Adopting the strategy described above has many implications for the present style of academic instruction. The most important of these implications pertains to course preparation. It is no longer appropriate, for example, to use textbooks for courses that are based on the methods and results of current disciplinary research. Textbooks, at least in anthropology, do not reflect the dynamic changes that take place in the field over the course of a single year. Because the focus of applied research and, hence, the employment situation in anthropology, can change rapidly, courses using the disciplinary research model must remain current. Textbooks can be used for supplementary reading, but are no longer primary in course work. This situation does not mean, however, that instruction in the fundamental theories, methods and techniques of anthropology is sacrificed by attention to current disciplinary research. On the contrary, instruction in these areas follows the new model based on the *application* of such theories, methods and techniques. The result will be the graduation of students who possess the same level of expertise in the fundamentals of the field, but also understand how anthropology functions in the marketplace, what employment opportunities exist, and how their skills qualify them for these jobs. By emphasizing these factors, anthropology and other disciplines in the humanities can become relevant to today's students.

A changed perception of relevance can be translated into increased enrollments, increased undergraduate and graduate majors and, eventually, expanded programs and faculties. Even so, disciplines like anthropology will never achieve the "relevance" now seen in the fields of engineering, business, and computer science. This degree of relevance, however, is not the long-term goal for anthropology. The long-term goal must be to train students in both the fundamental and practical aspects of the field and to allow them upon graduation the opportunity to compete with engineers, business people and computer scientists in the marketplace.

REFERENCES CITED

Belden, T.M. (Compiler)

n.d. a *State Employment Opportunities for Anthropologists.* The American Anthropological Association. Washington, D.C.

Belden, T.M. (Compiler)

n.d. b *Federal Employment Opportunities for Anthropologists.* The American Anthropological Association. Washington, D.C.

Landman, R.H. et al. (Editors)

1981 *Anthropological Careers: Perspectives on Research, Employment and Training.* Anthropological Society of Washington. Washington, D.C.

May, William F.

1985 Technology, Teaching and the Future. In*Teaching to Potential: Proceedings of the First Regional Conference on University Teaching*, pp. 1-31. New Mexico State University, Las Cruces.

Ward, R.E.

1985 Revitalizing Anthropology Programs: Suggestions for Attracting Majors and for Dealing with Enrollment Declines. *Anthropology Newsletter* 26(8):20-21.

Whitney, D.

1985 1985 Survey of Departments. *Departmental Services Program Report*, American Anthropological Association. Washington, D.C.

INFLUENCERS OF ACHIEVEMENT AMONG NONTRADITIONAL ADULT HEALTH PROFESSIONAL STUDENTS

by

Ruth B. Welborn

Southwest Texas State University

INFLUENCERS OF ACHIEVEMENT AMONG NONTRADITIONAL ADULT HEALTH PROFESSIONAL STUDENTS

Ruth B. Welborn
Southwest Texas State University

Introduction

Changes in health care delivery practices are creating new needs and determining new directions in the academic preparation of the health care professional. These directions gives focus to the preparation, maintenance, and improvement of the health professional with considerable attention being given to program development and management aspects of educational programs for the health professional. Germane to building a relevant curriculum is delivering the instruction, assessing achievement of the learner, and identifying factors that influence the achievement of the health professional learner.

At the same time that the examination of learning strategies is taking place and at the same time that the health care industry is seeking to attract individuals to the health industry which requires a higher quality of performance and knowledge base, university campuses across the country are experiencing dramatic changes in their student populations. Adults are returning to institutions of higher education and are seeking a different style of program delivery along with different educational strategies.

Colleges and universities have historically focused educational programs on the younger adult students, who are 18 to 25 years of age. Adults in their late twenties, thirties, forties, and older years have enrolled in increasing numbers as the number of traditional age students have declined (Wolfgang & Dowling, 1981, p. 640). As they see the older adult continuing to gain greater representation in the educational environment, these institutions are attempting to respond to the redefinition of institutional perspectives and to curricular and teaching strategies (Kasworm, 1980, p.44). The students who are returning to the formal educational environment have had extensive exposure to adult roles and responsibilities. Adults, who are returning from experience with employment or military service, parenthood, or marital status changes, do not need the same kind of educational orientation that the younger adult needs, particularly if the mode of instruction restricts the older student's sense of autonomy (Clarke, 1980, p. 92).

In the older adult student populations are the health professionals who need course offerings at times which accommodate both full-time employment in the health industry and part-time study in an accredited program in higher education. These students are returning to the campuses with an associate or baccalaureate degree in a health-related discipline and are seeking higher educational preparation. The traditional university model for education in which students are prepared to enter into a health profession provides a contrast to the education of professionals, who are active in the delivery of health services and who are returning to the university for a higher degree. Health professional education programs that are associated with institutions of higher education typically are designed in two formats. One format is a traditional educational one which is designed to prepare individuals to enter a health profession at an entry level, e.g. nursing, physical therapy, medical technology, respiratory therapy, or medical record administration. The second format is a type of educational program which is designed to focus on the functional role of the health professional in the areas of education, administration, and research.

In traditional university education the teachers provide instruction which assists students in transforming basic science concepts to the applied health specialty practice areas. In contrast the educational approach for health professionals who are returning to the university for higher degrees in selected areas is almost exclusively focused on an interdisciplinary approach to health care delivery and practice. This interdisciplinary approach creates a climate for collaboration among health professionals. Therefore, a knowledge of the effects of this cooperation among the health professionals who are functioning in this type of educational preparation could make a major contribution to improving the educational delivery system for health professional students who are returning to the university setting for additional education in a functional area of health care practice. It was this second format of university education in which this study was focused.

Background

The theoretical framework for this study rests in Lewin's Field Psychology (Lewin, 1936) and the Cognitive-Field Theory of Learning (Bigge, 1976). Within these theories, an individual's behavior is seen as a function of the person and the environment of the individual. This can be expanded to include the person's physical environment, classroom climate, teacher attitudes and instructional methods, work conditions, and familiar disposition. All have an impact on the individual learner's perception of appropriate conditions and mode for learning and may, therefore, affect the level of achievement (Schmidt, 1984).

The literature base supports the generalization that individuals do have a learning style which remains relatively constant over time and that it can provide direction for the instructional design. Teaching styles are viewed as influencing the interaction between the learner and the instructor. A variety of teaching styles are known to exist in adult learning situations. Yet, the relationship among learning style, teaching style, and learner achievement remains unclear. Repeatedly the call for additional research has been made to examine this interaction.

The literature base on the health professional students is limited in the areas of teaching styles and in the relationship of learning style, teaching style, and achievement. Therefore, further, systematic investigation is needed in the examination of the relationship of learning style and teaching style to adult learner achievement among allied health professional students.

Findings

This study investigated the relationship of learning style and teaching style to student academic achievement among nontraditional health professional students in credit seeking educational efforts. It involved 256 adult students in undergraduate and graduate health professional majors of allied health education, allied health research, and health administration. These students were in classes offered in the evening, on weekends, and at off-campus sites. The student's learning style was measured by the Canfield Learning Style Inventory (Canfield, 1983). The teaching style of the 18 instructors teaching these courses was measured by the Principles of Adult Learning Scale (Conti, 1982). Student achievement was indicated by the student's final course grade. Individual differences in student academic ability was adjusted for by using the student's overall grade point average as a covariant.

Analysis of covariance was used to examine the relationship of learning style to student achievement, teaching style to achievement, and the interaction of learning and teaching styles with achievement. In the area of learning style, achievement was greatest among those health professionals who preferred the conditions of a well-ordered classroom with a well-informed instructor, the content of working with numbers and logic, and the mode of direct experience, and who expected to do well in an academic setting. Teaching style produced highly significant differences in the amount of student achievement. While student achievement was above average for all teachers who practiced a highly consistent style, the greatest achievement was among the students of the teachers who practiced with slight modification the collaborative mode that is suggested in the adult literature. The only interaction between learning and teaching styles and achievement was in the area of the student's expectation of academic grade.

Conclusions

This study advances the education knowledge base on learning styles and teaching styles by examining student achievement in a specific adult learning situation. The failure of dominant mode to produce a difference and the nonsignificant findings of many elements of learning style could indicate that more needs to be done than just measure learning styles.

To affect learning, students may need to be informed of their style and information provided to help them capitalize on their learning strengths and develop their weak areas. Further indication is that a knowledge of the student's overall learning style or of the learning preferences in various areas composing learning style may not actually influence student achievement. The learner's final success in the educational setting may be dependent upon the appropriateness of the learning strategy utilized by the teacher.

The teaching style findings are generally congruent with the support of the teacher, as an important variable influencing the learning climate. Specifically the findings of this study suggest that teaching style has a significant influence on student achievement and that a collaborative mode of instruction supports the adult health professional students to achieve at a higher level. The significant teaching style findings decidedly show that treating the health professionals as adults while at the same time respecting the integrity of the curriculum facilitated the greatest amount of student learning. These findings imply that teachers need to take a careful look at themselves and their instructional practices.

Faculty development activities can be conducted to assist teachers to develop teaching styles that are congruent with research findings. As this study identified, teaching style does make a difference with student achievement. Allied health instructors need to be aware of this influence of teaching style. Teaching style assessments could be the first place to initiate these faculty development activities. Such diagnosis could be followed by learning resource identification and fiscal resource allocation to assist in the transition from any areas of teaching weaknesses to those of strength. Additional studies are needed to investigate the appropriate combination of student readiness for a teaching style that utilizes the student's self-direction. The most efficient student readiness and teaching style combination needs to be empirically determined.

Thus, the influencers of achievement among nontraditional adult health professional students are not seen in identifying the unique characteristics of each student such as learning style, but rather it includes a thorough analysis by teachers of their instructional behaviors and the consequences of their instructional actions. More importantly, this study identifies the importance of teachers providing a consistent style with their teaching.

References

Canfield, A. A., Canfield Learning Styles Inventory form s-a manual. Birmingham, MI: A.A. Canfield, 1983.

Clarke, J. H., Adults in the college setting deciding to develop skills. Adult Education, 1980, 30, 92-100.

Conti, G. J. The Principles of Adult Learning Scale. Adult Literacy and Basic Education, 1982, 6, 135-147.

Kasworm, C. E. The older student as an undergraduate. Adult Education, 1980, 31, 30-47.

Schmidt, S. D. Examining the learning styles of returning adults students: Emerging elements of best practice with implications for teaching styles. Proceedings of the 25th Annual Adult Education Research Conference, 1984, 184-189. ERIC Document Reproduction Service No. ED 242-248)

Wolfgang, M. E., & Dowling, W. D. Differences in motivation of adult and younger undergraduates. Journal of Higher Education, 1981, 52, 640-48.

WHOLE BRAIN RESEARCH AND IMPLICATIONS FOR SCIENCE TEACHING

by

Helena Whyte

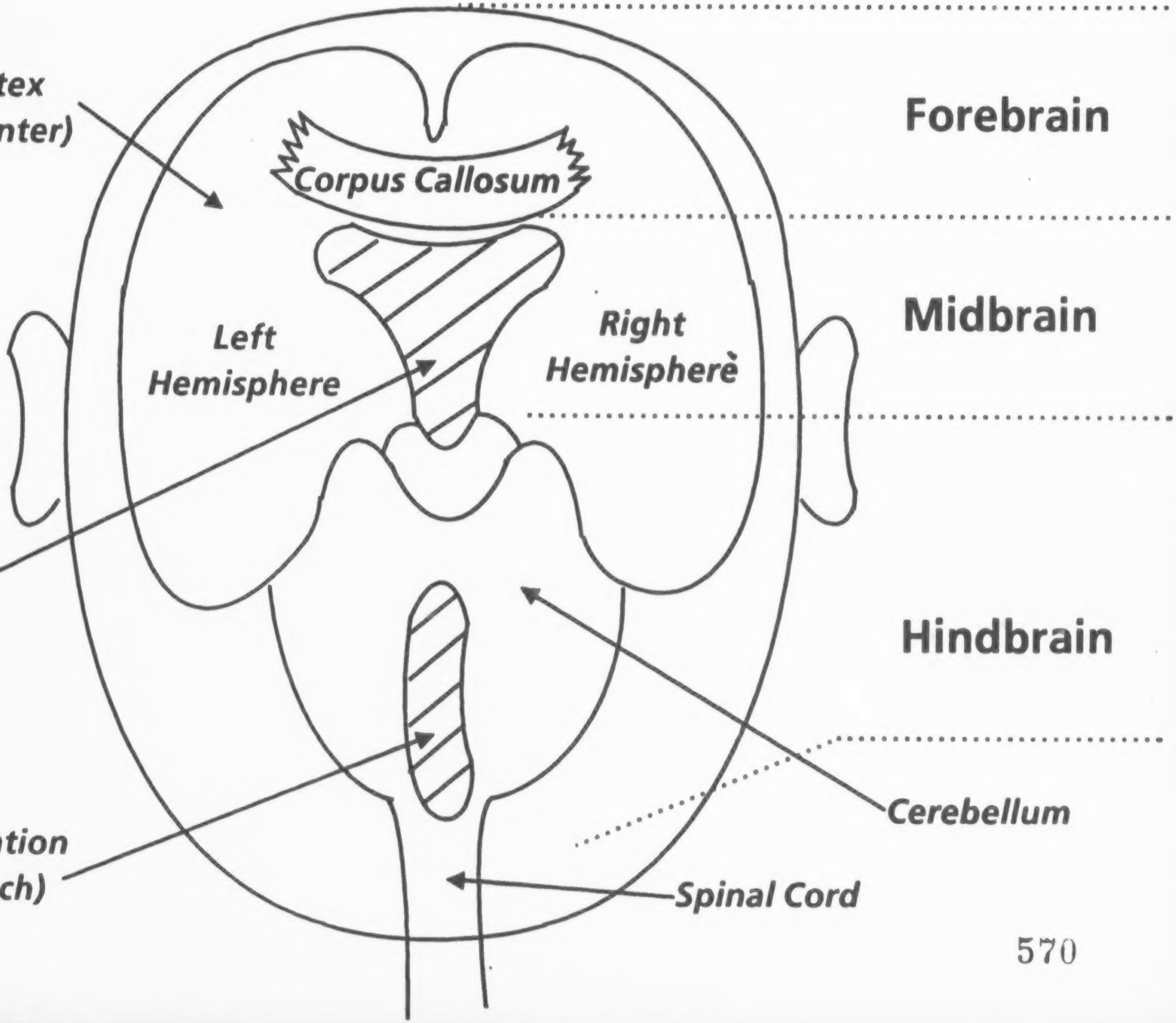
Los Alamos National Laboratory

Brain Physiology

The forebrain consists of the cerebral cortex, cerebrum and the corpus callosum. The cerebrum is composed of left and right hemispheres. The corpus callosum connects the two hemispheres. The two hemispheres are not identical in function and capability. For most people the left hemisphere is better at performing verbal, logical, sequential, analytic activities and non-verbal ideation, intuition, spatial, holistic, and synthesizing tasks. The left brain, then is good at languages, does well at arithmetic, and can solve problems through reason and logic. The right hemisphere is artistic, can see the "big picture," can help us drive cars and ski without cracking up, gets terrific flashes of ideas, and solves problems on the basis of feelings and hunches. The most effective and creative learning and living occurs when both hemispheres are working together.

The midbrain consists of several parts playing different roles in the way we think, feel and act. A group of these parts, the limbic system is significant in learning. The limbic system is located deep in the brain with each half of the system nested in the hemisphere near the corpus callosum. The limbic system acts like a switchboard monitoring and sending "messages" to the appropriate places in the cerebrum. The limbic system is the focal point in monitoring and controlling emotions, our likes and dislikes, enjoys, loves, and hates. The limbic system seems to be connected more to the right hemisphere than the left. This suggests that the right brain is more geared to deal with emotions and higher levels of thinking. This implies that strong emotion associated with learning has a greater chance of remaining in long-term memory. The negative side of this is that, if the strong emotion is negative and caused painful feelings, the brain may actually guard against recall of the learned information.

Human Brain Organization



Cerebral Cortex (Processing Center)

Corpus Callosum

Left Hemisphere

Right Hemisphere

Limbic System (Switchboard and Emotions)

Reticular Formation (Turn-on Switch)

Cerebellum

Spinal Cord

Forebrain

Midbrain

Hindbrain

The lower portion of the brain consists of the hindbrain and reticular formation. Most sensory input is filtered through the reticular formation. The reticular formation appears to be responsible for determining which data the brain will pay attention to and allow to pass to the limbic system and cerebrum. The reticular formation is an on/off switch for the whole brain; it is responsible for alertness. Novel, unexpected, or discrepant data "turns on" the brain. Malfunctioning or misfiring of the reticular formation is one cause of learning disability, hyperactivity, distractibility, lack of concentration and erratic and impulsive behavior.

Brain research indicates that for most of us, one of the two hemispheres is the dominant one in terms of a preferred mode of processing. No two individuals learn in exactly the same way. There also appear to be differences in male and female brain development. At question now is which has the predominant role in brain dominance, culture or hormones?

"How many windows in your home face the backyard?" There are two ways to answer this question. Using the left brain you would solve the problem analytically using a computational formula. Using the right brain you would solve the problem spatially by imagining the back of the house and counting the windows. Many everyday tasks favor the use of one hemisphere of the brain, either left or right but not both. Reading this is a left brain exercise. Imagining the furnishings in your living room arranged differently is a right brain exercise.

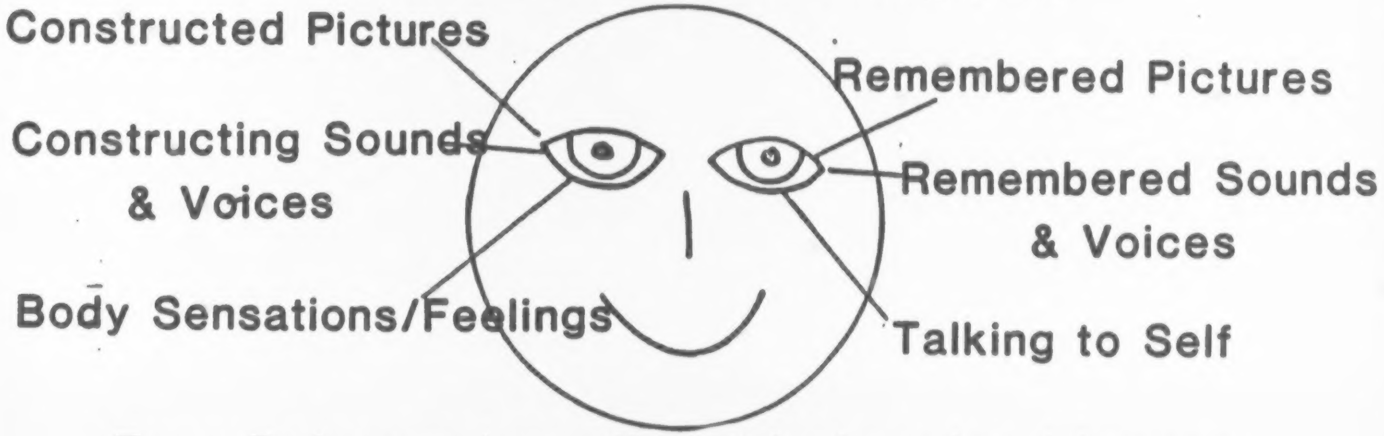
Recent research shows the relationship between eye movement and brain processes. The following chart indicates how you can see a person's brain process in action. Using the eye movements to watch a person's thinking process, determine the steps involved for her/his ability to: make a decision/generate a creative solution to a given problem/handle a complaint from another person/deliver a public speech or presentation/be positively assertive about a specific issue/write a memo/type/get rapport with another person/do anything which she/he does extremely well.

THINKING CUES (making the invisible visible)

THOUGHTS = Pictures, Sounds and Voices, Words
Feelings and Body Sensations

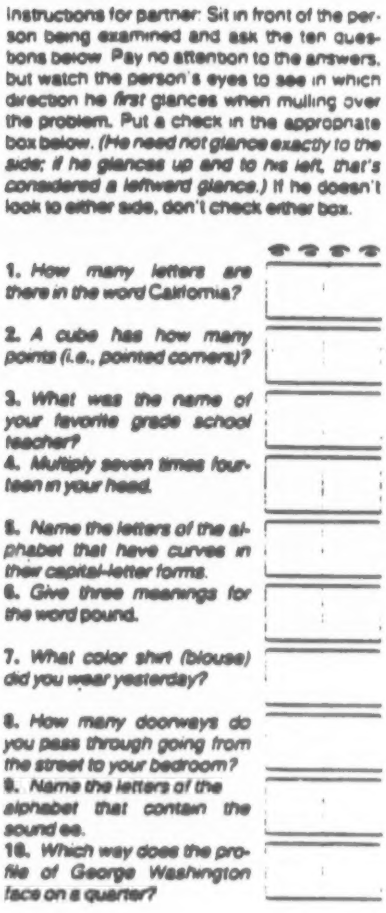
CUES ? Shifting of Eyes in Various Directions

(pretend this head is facing you)


Constructed Pictures
Remembered Pictures
Constructing Sounds & Voices
Remembered Sounds & Voices
Body Sensations/Feelings
Talking to Self

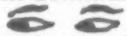
Eyes Defocused: usually retrieving visual images

To determine your own brain dominance, have a partner give you the following test taken from Discover, April 1985.



Instructions for partner: Sit in front of the person being examined and ask the ten questions below. Pay no attention to the answers, but watch the person's eyes to see in which direction he *first* glances when mulling over the problem. Put a check in the appropriate box below. *(He need not glance exactly to the side; if he glances up and to his left, that's considered a leftward glance.)* If he doesn't look to either side, don't check either box.

1. *How many letters are there in the word California?* ☐ ☐
2. *A cube has how many points (i.e., pointed corners)?* ☐ ☐
3. *What was the name of your favorite grade school teacher?* ☐ ☐
4. *Multiply seven times fourteen in your head.* ☐ ☐
5. *Name the letters of the alphabet that have curves in their capital-letter forms.* ☐ ☐
6. *Give three meanings for the word pound.* ☐ ☐
7. *What color shirt (blouse) did you wear yesterday?* ☐ ☐
8. *How many doorways do you pass through going from the street to your bedroom?* ☐ ☐
9. *Name the letters of the alphabet that contain the sound ee.* ☐ ☐
10. *Which way does the profile of George Washington face on a quarter?* ☐ ☐

Some studies suggest that people glance in the direction opposite to the hemisphere that is most active at the time. That is a person who looks to the left is using the right brain and the person who looks to the right is using the left brain. If most responses are the person is left brain dominant. If most responses are  the person is right brain dominant. If responses are equal, the person is considered a "whole brain" thinker.

BEST COPY AVAILABLE

Academic success appears to be influenced by a student's ability to use the proper side of the brain. Success in subjects requiring a high level of verbal fluency and memory accuracy is left brain dependent (English, languages, history, poetry). Success in subjects requiring holistic problem solving and imaginary manipulation is right brain dependent (science and mathematics). Successful students of physics, chemistry, and biology are right brain dominant.

The format of today's schools is primarily directed to the left hemisphere. School is highly verbal, drawing on the verbal-analytical function of the left brain. The consequence of this schooling is that the individual is deprived of the development of the right hemisphere and becomes a left brain dominant person.

Research shows that right-brain instruction with low-achieving students improves the student's understanding, motivation, and self-concept. Learning styles, then, refer to the method of introducing material, not the hemisphere we wish to educate.

Implications for Science Teaching

1. The most effective learning for length of retention and recall engages the learner in multisensory hands-on experience with real objects. Sciences have in the past done this well in their use of laboratory exercise for instruction. In science the texture, smell, sound, looks and sometimes taste have all been an integral part of the discovery process. Imagine learning how to dress yourself, to type, to cook, to sew or to input data into a computer through the purely lecture mode. I am concerned with the overreliance of computer simulation to cut down on lab costs and OSHA compliance. Some experiences can be enhanced or shortened using computer simulations, but the overuse of these or to use these exclusively, would take a meaninful part (and the most right-brained part) out of the sciences. We must bear in mind that science is a learning based on experiments.

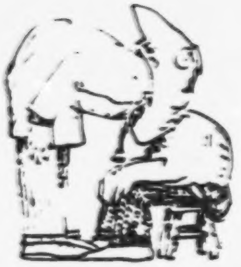
2. Don't worry if students are right-brained, left-brained, visual, auditory or haptic. Offer a wide variety of activities for students to express their learning. Students will find their own match of learning style preference. Students should not only select their preferred way of learning, but they should also be challenged to try other modes of engagement and expression. Puzzles and brain teasers are short ways to offer new challenges. Some examples are included here. A greater variety of games can be found in the monthly magazine Games.

3. Students' learning experiences should be pleasurable and deal with novel, unexpected or discrepant information. This type of interaction causes the reticular formation to switch on the brain making the person more alert and allows the limbic system to engage the whole brain. Repetitive tasks, work sheets, drill and practice are counter productive. This is another reason why overuse of computer simulation can be detrimental. Pleasurable does not mean that the educational experience must be "nonthreatening" or non-challenging. Challenges engage the whole brain, generate excitement, interest, and attention. The study of science fiction jars students out of linear thinking, helps them synthesize ideas, and encourages them to think holistically. Students can be asked to write science fiction essays after the appropriate concepts have been discussed in class. Some topics are: consequences of non-quantization, what if Planck's constant was equal to one erg second, what if the living world was based on silicon chemistry rather than carbon chemistry, what if human eyes were sensitive to some other part of E. M. Spectrum, what if you awakened in the year 3000 after being cryogenically frozen.

4. Talking is important for "whole brain" development and learning. A "stop talking" environment interferes with whole brain learning. Students need to talk about what they are experiencing and what new ideas are being

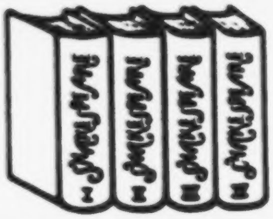
BRAIN TEASERS FROM

"CREATIVE BRAIN STRETCHERS"



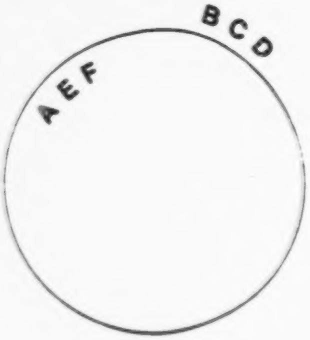
Write several captions for this cartoon.

There are four volumes of Shakespeare's collected works on a shelf.

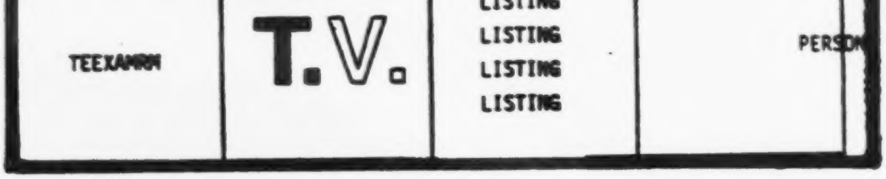


The pages of each volume are exactly 2 inches thick. Each cover is 1/6 of an inch thick. The bookworm started eating page 1 of volume 1 and ate through to the last page of volume IV. What is the distance the bookworm covered?

Determine the system being used to place all the letters of the alphabet either inside or outside the circle. A goes inside. B goes outside. C belongs outside. D belongs outside. E and F go in the circle. Where do G, H and the rest of the alphabet belong? What is this system?



Word Games from More Games Trainers Play



1 Hopes	2 ESRON RIDING	3 S M O K E	4 FALL ALOHA SUMMER HI WINTER HELLO SPRING SHALOM
5 TEEXAMRN	6 T.V.	7 LISTING LISTING LISTING LISTING	8 PERSON

generated for concept understanding and holistic thinking to evolve. Team work also needs to be fostered. Students engage individually in the academic environment; while workers seldom work alone on a project. We must also educate how to work together for transference of skills to the workplace. Group discussions and role plays are one way of achieving these goals in a controlled fashion.

5. A relaxed and secure learning environment enhances learning. When there is low stress, an atmosphere of trust, and when both sides of the brain are engaged, the limbic system will react favorably. When threat or fear are high the limbic system "shuts down" the cerebrum. In this state only rote learning can occur. Music is relaxing and both brain hemispheres are involved in the appreciation of music. Background music can enhance your lectures. Use dramatic music such as Beethoven's Fifth Symphony or "Pomp and Circumstance" for demonstrations. Use "Mozart's Fortieth Symphony" or the sound tracks from "Star Wars," "2010," "2001: A Space Odyssey," or "StarTrek" for background music at labs. Humor is also relaxing. Play Tom Lehrer's lyrics for the Periodic Table, New Math, Pollution or write your own lyrics to popular tunes as an introduction to new topics.

6. Information presented logically, in an orderly way, in small increments is often ineffective and confusing. Time-on-task approaches, minimum competency testing and mastery learning stifle learning, creativity, favorable attitudes toward science, and hinder the development of independence. Ask the students to use their new knowledge to generate new ideas. Some choices are: best idea for recycling a common item, designs for perpetual motion machines and scenarios for the year 2050.

Industry is asking for college graduates who can read, write, communicate and think. Applied creative thinking is whole-brained. The ability of people to function as whole-brain persons is enhanced by having a climate where both sides of the brain are used, by validating the existence of brain dominace in others and their differences, and by facilitating an individual's ability to access both sides of the brain.

BIBLIOGRAPHY

1. Brain Series, PBS 1985.
2. "Which Side Are You On," Discover, April 1985, pp 40-41,60.
3. Cohen, H., Harak, W., Stalley, F., "Brain Physiology and Implications for Schooling," Teaching Science As A Decision Making Process, DuBuque Iowa: Kendall/Hunt Publishing Co., 1984.
4. Herman, N. "Brain Update Summary".
5. Levy, J., "Research Synthesis on Right and Left Hemispheres: We Think With Both Sides of the Brain," Educational Leadership, January 1983, pp 66-71.
6. Lord, T., "A Plea for Right Brain Usage," Journal of College Science Teaching, November 1984, pp 100-102.
7. Newstrom, J., Scannell, E. More Games Trainers Play.
8. Raudsepp, E., "Creative Brain Stretchers," The Executive Female: The Successful Manger, 1985.
9. Sasaki, S., "Chemical Education in the Computer Age," Proceedings: The Eighth International Conference on Chemical Education, August 1985.
10. Shuman, R., "Fantasy and the Brain's Right Hemisphere," Research in Education, April 1984.
11. Singh, S., Singh H. "Creative Science Fiction As A Teaching Tool," 187th ACS National Meeting, April 1984.
12. Wright, J., Teaching Science Today, J. Weston Walch Publisher, 1982.

APPENDIX

BIOGRAPHY - DONALD C. ROUSH

In dedication to his 35 years of teaching improvement in New Mexico, the New Mexico State University Deans' council will announce the recipients of the Donald C. Roush Awards for Teaching Excellence. In the program initiated in 1984, recipients were selected by ballot by the graduating seniors at commencement. The award will consist of an inscription-bearing medallion with the recipient's name and year of the award.

Dr. Roush retired in July 1985 from the position of Executive Vice President at NMSU. He has been involved in New Mexico education since 1950, when he began teaching in Los Alamos. There he was an elementary, junior and senior high school teacher as well as a high school principal. In 1955, he became Director of Field Services for the New Mexico Education Association (now National Education Association--New Mexico).

Four years later, Dr. Roush joined the faculty of New Mexico State University and became Dean of the College of Education. He retained this position until the summer of 1968 when he was appointed Academic Vice President, with the title changing to Executive Vice President in 1979.

Dr. Roush has been examiner and consultant of the North Central Association as well as past president. He has published extensively in the field of education and is called on frequently as a consultant at both national and state levels. His seminars over the last 21 years on university teaching effectiveness have gained international recognition.

He received his bachelor's degree from Drake University and his doctorate from the University of Northern Colorado. In 1982, he was honored by the University of Northern Colorado as Outstanding Alumnus in the Field of Education.

NMSU honored Dr. Roush in January 1983 with the President's Award for Service "in recognition of a career dedicated to excellence in teaching as manifested by his outstanding work with faculty and students at NMSU and other universities."

DONALD C. ROUSH EXCELLENCE IN TEACHING AWARD
1986

COLLEGE OF AGRICULTURE

David G. Lugg, Associate Professor Crop and Soil Sciences Ph.D., 1978, Cornell University

COLLEGE OF ARTS & SCIENCES

David W. Martin, Department Head & Professor Psychology Ph.D., 1969, Ohio State University

Latimer R. Evans, Professor Chemistry Ph.D., 1945, Purdue University

COLLEGE OF BUSINESS ADMINISTRATION & ECONOMICS

Edmund A. Scribner, Assistant Professor Accounting & Business Computer Systems Ph.D., 1964, Oklahoma State University, CPA

COLLEGE OF EDUCATION

Roy C. Rodriguez, Associate Professor Educational Management and Development Ph.D., 1976, University of Texas, Austin

COLLEGE OF ENGINEERING

George W. Lucky, Professor Electrical and Computer Engineering Ph.D., 1965, Oklahoma State University

COLLEGE OF HUMAN & COMMUNITY SERVICES

David E. Leas, Assistant Professor Psychology, NMSU-Alamgordo M.A., 1974, Ball State University

Jimmy P. Gentry, Professor Mathematics, NMSU-Carlsbad M.A., 1971, University of Illinois

Eula Fern Thompson, Instructor Secretarial Administration, NMSU-Dona Ana Branch M.A., 1981, New Mexico State University

Cecilia Perrow, Assistant Professor History, Government, Education, NMSU-Grants M.A.T., 1972, New Mexico State University

Frances (Betty) E. Harris, Associate Professor Nursing, NMSU-Main Campus M.A., 1978, New Mexico State University

NOTE: Recipients of the Donald C. Roush Awards for Teaching Excellence were chosen by the Deans of the six colleges at New Mexico State University based on input from a variety of sources including the results of the 1985 Commencement Survey.

VENDOR TRACK

East Ballroom, Corbett Center

Thursday, January 9, 1986	Friday, January 10, 1986
9:45 - 1:30	9:45 - 1:30
2:30 - 4:45	2:30 - 3:00

These vendors exhibited application of computer technology to higher education.

1. Advance Scientific Research (Albuquerque): Image processing, artificial, intelligence, controls and workstations development/consultant.

2. AT&T (Albuquerque): Communications technology and computer manufacturer.

3. Computer Systems, Inc. (Las Cruces): Image processing and computer vendor.

4. El Paso Education Services (UTEP/El Paso): Skills testing, educational consultants.

5. Hewlett-Packard (El Paso): Computers and instrumentation manufacturer.

6. IBM (El Paso): Computer manufacturer, software development.

7. Xerox Corporation (El Paso): Computers and copiers manufacturer.

COMMITTEE ON COLLEGE TEACHING

William Call	College of Business Adminstration and Economics
Lowell Catlett	College of Agriculture and Home Economics
William Conroy	Executive Vice President - NMSU
Tom Cyrs	Center for Education Development
Marie Heaton	College of Arts and Sciences
Jo Hill	College of Human and Community Services
Margie Kitano	College of Education
Miriam Meyer	Office of the Vice President
Joseph Rogers Chair, 1986	College of Arts and Sciences
Raymond Willem	College of Engineering
Michael Wolf	Office of the Vice President

CONFERENCE COORDINATORS

Carlton Dukes	Vendor Track Coordinator
Dorothy Webb	Program Coordinator

ALPHABETIC LISTING OF AUTHORS

		PAGE
Abercrombie, C. Lynn	Memphis State University	137
Aguirre, Adalberto	University of California	249
Ainsworth, Len	Texas Tech University	257
Ammentorp, William	University of Minnesota	51
Arciniega, Tomas	California State College, Bakersfield	229
Barber, Charles T.	University of Southern Indiana	395
Barker, Narviar Cathcart	Georgia State University	265
Bergsma, Harold M.	New Mexico State University	19
Blystone, Robert V.	Trinity University	405
Brentlinger, W. Brock	Lamar University	29
Buchanan, Edsel	University of Nebraska at Omaha	41
Burke, Janet	University of Lowell	277
Burnham, Christopher C.	New Mexico State University	415
Chaffin, Paulette	University of Minnesota	51
Chang, Moon K.	Peru State College	427
Chu, Lily	New Mexico State University	437
Civikly, Jean M.	University of New Mexico	287
Connellee, Barbara G.	Los Alamos National Laboratory	67
Corder, Jim W.	Texas Christian University	447
Crosby, Glenn A.	Washington State University	381
Curtis, Mark H.	Association of American Colleges	1
Demos, Elene	Texas Christian University	525
DeRosier, Linda Scott	The College of Idaho	461
Descamps, Jorge	The University of Texas at El Paso	337
Dillaway, Manson P.	New Mexico State University	473

		PAGE
Dingman, Paul R.	Oregon Graduate School of Professional Psychology	77
Dukes, Carlton W.	New Mexico State University	89
Ellerbrock, Michael J.	East Texas State University	101
Ewing, Gordon J.	New Mexico State University	485
Fairbanks, J. David	University of Houston-Downtown	347
Fernandez, Celestino	The University of Arizona	111
Fitzgerald, Michael	Medgar Evers College of the City University of New York	299
Ford, Daniel G.	Southern Arkansas University	495
Frost, Charles H.	New Mexico State University	125
Green, George K.	Pan American University at Brownsville	311
Heger, Herbert K.	The University of Texas at El Paso	323
Hernandez, Norma G.	The University of Texas at El Paso	337
Hoag, Edwin R.	Texas A & M University	507
Hummel, John H.	University of Houston-Downtown	347
Lamb, Charles E.	The University of Texas at Austin	519
Lindsay, Barbara	New Mexico State University	205
Lohr, Cherie	Texas Christian University	525
Long, Richard L.	New Mexico State University	536
Loveland, Terry L.	Southwest Missouri State University	137
Machemehl, Randy B.	The University of Texas at Austin	545
Matchett, William H.	New Mexico State University	205
Millard, Thomas L.	Montclair State College	149
Moellenberg, Wayne	University of New Mexico	161
Musiak, Thomas A.	Kansas State University	173
Peterson, Robin T.	New Mexico State University	359

		PAGE
Potter, Eugenie	Arizona Research Associates	193
Salinger, Terry	The University of Texas at El Paso	323
Schaffran, Jerome A.	The University of Rhode Island	553
Sheehan, Jacqueline	New Mexico State University	205
Shook, Ronald	Utah State University	369
Upham, Steadman	New Mexico State University	561
Welborn, Ruth B.	Southwest Texas State University	573
Whyte, Helena	Los Alamos National Laboratory	581
Wilkerson, Norma Neahr	University of Wyoming	217